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ECONOMICS FOR ENGINEERS

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ECONOMICS FOR ENGINEERS

BY

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PREFACE TO THE SECOND EDITION

Every chapter in the book has been completely rewritten in this revision. In addition, new chapters have been added and the order in which the chapters appear has been altered materially. Two considerations have motivated these changes. First, the significant economic changes since the first edition was published in 1931 have made obsolete the descriptive sections of any economics text that is more than a few years old. Second, the continuous use of this book as a text at The Ohio State University and at other institutions has disclosed new and superior techniques by which the changing subject matter may be adapted to the particular needs of engineering students. In this adaptation the views and suggestions of practicing engineers, many of whom studied economics as part of their engineering training, have been given at least equal weight with those of economists who, like the engineers, were kind enough to render assistance.

The principal changes from the first edition are:

1. A new introductory chapter emphasizes the impact of technological progress upon the economic system as well as the limitations that economic considerations place upon technological advances.
2. A new emphasis upon "methodology" in the social sciences as contrasted with the physical sciences seeks to orient the engineering student in this field of study.
3. A new discussion of the legal background of the present economic system is presented in the effort to throw into bold relief the foundations of capitalism.
4. An additional chapter on money and banking gives more emphasis to the place of credit in the economic system.
5. A completely revised chapter and an additional chapter on foreign trade and finance emphasize our changing international relationships and indicate their significance for the national economy.

6. The new and enlarged treatment of labor relations explains the rapidly changing relationships between employer and employee in terms of current problems.

7. The movement for social security is analyzed in a new and enlarged discussion of this vital question.

8. A new approach to the problem of collectivist economic systems is presented in a form that permits a review of the economic theory of capitalism.

9. The revised order in which the chapters are presented is the result of continuous experimentation with this vexatious problem and embodies an arrangement which seems to give the best results in terms of student appreciation of economic problems, namely, description of outstanding characteristics of the present system, value and distribution theory, and application of the theory to the leading problems of the day.

Acknowledgment of help received in making the revision is due a number of our associates, particularly Dr. J. M. Whitsett, Edward C. Welsh, Leonard A. Doyle, and Samuel Arnold. The thanks of the authors also are due those users of the first edition, both teachers and students, who have been kind enough to make helpful criticisms and to give suggestions.

EDISON L. BOWERS.

R. HENRY ROWNTREE.

THE OHIO STATE UNIVERSITY,
September, 1938.

PREFACE TO THE FIRST EDITION

The significant part played by the engineering profession in our present economic life requires every technical student to have a knowledge of economic principles. The importance of this knowledge has been indicated, in the following words, by The Society for the Promotion of Engineering Education:

Recently the Dean of one of the large schools of Business Administration defined Engineering as "applied economics." Whether one agrees with the definition or not, one cannot avoid the conclusion that a knowledge of economic theory, accounting, and statistical analysis is absolutely essential in modern business, and that if the engineer is to be a leader in modern business he must possess this knowledge.¹

"Economics for Engineers" has been prepared to meet the real need found by many teachers of economics, as well as by The Society for the Promotion of Engineering Education, for a practical presentation of economic principles and problems designed especially for engineering students.

"Economics for Engineers" differs from the usual economics textbook in three respects:

1. The treatment of the subject has been made as concise as possible. The demands now made upon the time of engineering students are so great that they cannot be expected to master successfully a lengthy presentation of the subject-matter of economics.

2. Some important aspects of business activity not ordinarily included in economics textbooks, such as marketing, investments, and insurance, are discussed because many engineering students would have no other opportunity to study them.

3. The emphasis throughout the book is directed toward the engineering aspects of economic theory and business activity. Accordingly the discussion of such a topic as *value* is less extensive, of *costs* is more complete, and of *pricing* is more practical than is usual.

The purpose of the book is, therefore, to present a factual basis for a practical understanding of the economic life of which every engineer is inescapably a part.

The increasing complexity of economic activity requires the order of treatment of the various topics to deviate somewhat

¹ "Report of the Investigation of Engineering Education: 1923-1929," Vol. 1, p. 1039, Society for the Promotion of Engineering Education, 1930.

from the traditional "natural" unity and arrangement. Some aspects of public utilities, for example, are discussed in several different chapters. This procedure is necessary for the same reason that engineers do not study automobiles as such, but rather study physics, chemistry, electricity, and internal combustion motors. The treatment in "Economics for Engineers," in view of the readers for whom the text is primarily intended, has thus been adapted to the special needs of these professional students.

In writing this book we have become indebted to a number of persons whose ideas, suggestions, and writings have been very helpful. We wish particularly to express our thanks to Dr. Joseph J. Spengler of the University of Arizona, Dr. Henry B. Hass of Purdue University, Professor Sada A. Harbarger, Mr. D. M. Shonting, and Mr. J. M. Whitsett of The Ohio State University. With these friends we gladly share any merit the book may have, but we in no sense hold them responsible for any of its imperfections.

EDISON L. BOWERS.
R. HENRY ROWNTREE.

THE OHIO STATE UNIVERSITY,
April, 1931.

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PART I
INTRODUCTION

CHAPTER I

ECONOMICS AND ENGINEERING

We live in a changing world. Some of the things we see about us will be changed before the day is over; many more things will be altered by the end of the year; most of the things with which we are familiar inevitably will be changed long before our normal life span draws to a close. Yet these changes are not confined to the arrangements of the calendar, or to political boundaries, or to any one set of causal circumstances. Some of the changes lie wholly within our control; most of them are beyond the control of any individual or group of individuals. Some of the changes can be predicted; many of them cannot. All of them have effects, good or bad, trivial or far-reaching, upon people and institutions not only near at hand but in the four corners of the earth.

Economic Interdependence.—Change is significant because of a high degree of economic interdependence. So closely coordinated is the mechanism of modern civilization that a change occurring in any one sector is likely to affect many other parts. (People generally do not live and work in isolation; they depend upon one another for many things. The degree of interdependence has increased steadily, partly because of a marked increase in the number of persons living in a given area, which has necessitated changes in the methods for satisfying human wants; partly because of an extension of the profit motive, indicative of the acquisitive nature of our society, which forces contacts with and dependence upon others; and partly because new inventions and discoveries are bringing people closer and closer together, sometimes for mutual cooperation in peaceful pursuits and sometimes, unfortunately, for conflict.)

(Perhaps the significance of our interdependence is impressed upon us most in our daily efforts to make a living.) The day of the backwoodsman who was sufficient unto himself for all his needs has long since passed away, except in a few remote parts of the world. Dependence upon others for the necessities of life is so acute that most persons would starve if deprived for even a brief period of commodities produced by others. / The basic food sup-

ply of most large cities would be depleted in less than a week, and in the case of milk in less than a day, were the warehouses and stores not constantly replenished by an endless procession of trains, ships, and motor trucks. Literally thousands of persons cooperate in the preparation of a simple breakfast.

(Interdependence is to be found not only in the consumption of goods but also in their production.) In aircraft manufacture, for example, the work has been so thoroughly divided that any one workman performs only an exceedingly small part in the fabrication of an airplane. Furthermore, some parts of the plane usually are purchased from other producers. Thus a company which specializes in large passenger planes may make the fuselage but purchase the motors from another company, the propellers from a second firm, and the landing gear from a third. The producer of motors in turn may buy spark plugs, carburetors, and other parts from a dozen other companies. In all, perhaps a hundred or more separate and distinct producers may be involved and, if this voluntary cooperation is considered in the field of the preparation of raw materials and semi-finished products, the number of producers may reach many thousands.

(Interdependence in manufacturing fields requires a high degree of coordination. XThe products of several plants may be synchronized by the use of exact engineering specifications and by the application of economic principles of costs and returns.) Within any producing unit, the greater the division of labor and the use of complicated machinery, the greater are the opportunities for enlarged output at low cost but the greater, also, is the possibility that there may be inadequate coordination, with resulting wastes and inefficiencies. } The steel industry offers one of the best examples of synchronization. In the most modern type of hot strip mill, rolls of hot steel race out at a speed of nearly half a mile a minute. To produce this remarkable result some 600 men working at a series of connected machines must time their efforts to the split second. If one operator neglects his machine long enough for a strip to "buckle back," a roller may be broken and the entire operation halted for several hours with a loss of thousands of dollars.

(The evidence of growing economic interdependence is everywhere about us. Each time an article or a service is bought and sold someone is showing his dependence upon someone else.

Each time goods pass in transit, on land, on sea, or in the air, someone is registering his dependence upon others.) A steel strike in Pennsylvania or Illinois may curtail automobile production in Michigan or retard building operations in New York; may force coal mines in West Virginia or Kentucky to close and ore boats on the Great Lakes to remain idle. Railroads in a score of states may feel the effects of reduced carloadings. Some people will have less money to spend for California fruits or Oklahoma oil or thousands of other domestic and foreign commodities with harmful results to people in all walks of life. The declaration of war or even the threat of armed strife on the other side of the world may induce a frenzy of activity in the scrap-metal market of the United States; may raise the price of American grains and beat down the market value of American stocks; may force drastic revision of American shipping policies and raise the premium rates on the insurance of goods in ocean transit.

Economics and Engineering.—(“Engineering” has been defined as “the conscious application of science to the problems of economic production.”¹ The essence of engineering is to *change* something but, as this definition implies, the change must be made in an *economic* manner. Therefore the word “economic,” which will be discussed in detail in the following chapter, is the connecting link between engineering and production. Because of the high degree of interdependence noted above, any change in production necessarily will have effects, desirable or undesirable, upon persons, things, and institutions.) (In other words, engineering achievements vitally affect the economic system.) Equally important is the fact that the practical achievements of engineering depend upon the economic system. These important causal relationships will now be analyzed in some detail.)

I. THE IMPACT OF ENGINEERING ACHIEVEMENTS UPON THE ECONOMIC SYSTEM²

/Engineering achievements exercise a profound influence upon the operation of the economic system. Methods of fast transpor-

¹ HARDING, FRANCIS, and DONALD CANFIELD, “Business Administration for Engineers,” McGraw-Hill Book Company, Inc., 1937, p. 3.

² The Report of the Subcommittee on Technology to the National Resources Committee, “Technological Trends and National Policy,” 1937 (Superintendent of Documents, Washington, D. C.), has been drawn upon for some of the material in this and the following section.

tation, rapid communication, or cheap transmission of power; new ways for constructing old things; new uses for new things—in short, a more complete utilization of natural resources—have caused far-reaching modifications of parts of the economic system and of the economic and social status of people living within the system.

Engineering achievements exert their impacts upon the economic system through primary and derivative effects. Some primary effects of introducing tractors on farms, for example, are the replacement of horses or mules, the purchasing of gasoline and oil, and perhaps the throwing of two or three fields into one. Each primary effect may have many derivative effects which, in turn, may have still more derivative effects.

Thus, as the tractor replaces animals on farms there follows as a derivative influence less need for horse feed, which means that the land used for growing such feed is turned to other uses. This is a secondary effect. As land formerly used for stock feed yields other crops, the quantity of other agricultural products is increased, which tends to lower their prices. These lower prices are, in turn, mirrored in land values, perhaps in demands for tariff protection. Thus these various derivative influences occasion effects, secondary, tertiary, and so on. Each effect follows the other much like links in a chain, except that the succeeding derivative effects become smaller and smaller in influence. The effect of the tractor on lobbying for a higher tariff is very slight in comparison with other forces. A derivative effect in another direction is the stimulation the tractor brings to the cooperative movement in various ways, but especially in the purchase of gasoline.¹ ✓

Inventions and Patented Processes.—New engineering developments usually are preceded by a series of inventions and new processes which do not exert their social effects, on the average, for some 30 years. A banker once defined invention as that activity which made his securities insecure. An invention by its very nature suggests changes with far-reaching consequences. Usually it means that one thing is to be substituted for another. Of the four material factors which determine the well-being of nations—invention, population, natural resources, and economic organization—invention changes most frequently and hence is most often a cause of other changes. Invention is becoming increasingly a matter of directed laboratory research. Corpora-

¹ "Technological Trends and National Policy," 1937, p. 9.

tions are in the anomalous position of having to finance research which continually upsets present methods. As one of the great researchers, Kettering, puts it, "one of the research man's jobs is to keep you reasonably dissatisfied with what you have." A corporation which anticipates the findings of competitors need not be taken off its guard by the sudden introduction of new processes.

About 50,000 patents a year are now being granted in the United States. Over 20,000 basic patents alone are outstanding on carburetors for gasoline motors. Patent requests for air-conditioning equipment are coming in at the rate of 300 a day. So persistently do researchers seek to overcome serious obstacles that one finds, for example, twenty-five distinct ways for combating fog, the great bogey of airplane flight. The plane, the pilot, the landing field, the atmosphere, and the weather all come in for consideration.

Typical of the inventions which have materially affected a wide diversity of manufacturing operations is that of welding, including the promising development of brazing.

The results affect much more than just the direct engineering economy. The more skilled trade of welder replaces that of riveter. The fearful noise of riveting is eliminated. Metal is economized, and capital is further saved through assembly savings and the greater durability of welded products. Longer life, by diminishing replacement, tends to slow up invention. Welding, more than riveting, but less than casting, fosters neatness of form, curves, streamlining, and the new art style of metal architecture. It helps especially in the manufacture of airplanes, automobiles, high-speed trains, and many other devices, mostly in transportation that especially need lightness, trimness, or permanently tight joints. Welded ships are being built. The shipbuilding trades of riveter and caulker may eventually become obsolete. By related devices, machining is being reduced by "flame machining" with the oxyacetylene torch, and metal is being cut by the "electric arc cutting saw."¹

Another discovery which has revolutionized many branches of industry is high-speed tool steel.

This introduction of one simple improvement so changed the industrial picture in this country that the efficiency of all industries underwent an estimated increase of some 15 percent. In other words, the increased

¹ *Ibid.*, p. 25.

productivity of all industries, due to the introduction of high-speed tool steel, amounted to about 8 billion dollars per year. All this was accomplished by the utilization of about 20 million dollars' worth of these special steels per year plus, of course, the required additional investments in new machines. This is one of the most phenomenal examples of the immense effect of one small development.¹

Probably the leading invention of the twentieth century from the standpoint of multiple uses and their effects upon many aspects of the economic system is the photo-electric cell form of the electron tube, popularly known as the electric eye.

This eye sees everything that the human eye can see and more. It is even said to be able to detect certain kinds of counterfeit money. It will distinguish colors better than human beings can do. When it is joined with another form of the electron tube, the vacuum tube, it becomes able to act on what it sees. Thus it sees a waitress approaching a door with trays in both hands and at once swings the door open for her to pass. Unlike a human being it does not suffer from fatigue. For instance, in a factory it can watch the tin cans go by on a belt, pick out the defective ones, letting only the good ones go by. This monotonous work can be done without strain for as long hours as the manager wishes. That it will cause unemployment is obvious, but it will also lighten the tasks of the workmen. Indeed it brings the automatic factory and the automatic man one step closer. It may be used to regulate automobile traffic, to measure the density of smoke, to time horse racing, to read, to perform mathematical calculations. Hardly a month passes without some new use of the photo-electric cell being reported. Indeed it will require decades to learn the many things this versatile instrument can do.²

The Significance of Transportation.—The cumulative effects of long years of engineering developments probably are seen more clearly in transportation than in any other industry. Steam- and later electric- and gasoline-powered transport have had and are having profound effects upon the economic system. It is highly improbable that the 3 million square miles comprising our forty-eight states could have been held together without an efficient transportation system. Certainly the division of labor described above could not be carried out without means for transporting goods and people. Just as the railroads caused cities to spring up

¹ *Ibid.*, p. 354.

² *Ibid.*, p. 5.

all over the country, so the automobile is changing them, "hurling their population with a centrifugal force outward into the suburbs and drawing into an ever-widening trade area inhabitants from remote regions." The automobile has destroyed some industries, modified others, and created new ones. Through direct competition the electric lines between many towns and cities have perforce been abandoned. The entire petroleum industry had to be overhauled. In 1909, for example, gasoline represented less than 10 percent of the petroleum distillates, but in 1934 it represented 44 percent. Automobile tire and accessory factories, garages, and filling stations have sprung up on every side, giving employment to thousands. Schools have been centralized; better highways have been built; real estate values have been altered; automobile accidents have greatly increased.

Air transport appeared about the time people were becoming adjusted to some of the major changes brought by the automobile. What its future will be is a matter of conjecture. "Forecasts written 20 years ago in a spirit of scientific caution, seem stupidly unimaginative today." In the light of the progress being made in the superoxygenation of the air, the improvement of Diesel engines and of fog-control devices, and particularly the development of steep-flight aircraft, the possibilities appear to be unlimited.

The consequences to aviation and civilization from the power of landing and taking off almost anywhere promise to be immense, multiplying the usefulness and safety of aircraft many fold. Almost all of the globe would be open to air traffic, including the places today least accessible to fast land or air transport, such as wildernesses, mountains, ships, and city centers. The present airplane type doubtless will continue in use for high-speed, long-distance, large-unit traffic; steep-flight aircraft may be expected to supplement the airplane, not to supplant it. For example, the highest paying demand for aviation is for transporting passengers, mail, and express between the centers of great cities. The slow trip through crowded streets to the airport at the edge of the city is a drawback to long flights and a preventive of short flights. But the "roof-hopper" would know no such difficulties. If it will soon be practicable to put passengers or mail aboard a steep-flight aircraft in the center of a city and fly to a suburban airport on cheap land in a few minutes it may not be worth while today to build airports and buy expensive land near city centers.¹

¹ *Ibid.*, p. 28.

✓II. THE IMPACT OF THE ECONOMIC SYSTEM UPON ENGINEERING ACHIEVEMENTS

Paradoxical as it may seem, the force which has done most to raise an increasing proportion of mankind from a condition of savagery to what we have chosen to call civilization is also responsible for the creation of many of the economic and social problems confronting us today.) Technology¹ itself is not to blame for mixing unfavorable results with desirable ends. The difficulty arises in the way technology is applied, the uses to which it is put, and the inability of individuals, businesses, and governments to make adjustments rapidly enough to avoid the serious dislocations caused by technological advances. (In raising the standard of living through the reduction of scarcity, technology sometimes permits certain groups in society to reap large gains, others to share only to a limited degree, and still others, perhaps, to be definitely harmed.) To take a historical case, Watt's development of the steam engine (1769), by demonstrating how to turn heat into mechanical power effectively, made possible greater human happiness in years to come but temporarily increased the hardships of some persons. His invention changed England from an agricultural to an industrial country and led to a tremendous increase in production, but it also sent more women and children from the homes into the factories, where work was sometimes carried on under most unwholesome conditions. The congestion of the towns and cities increased, more accidents occurred, and the workers, now cut loose from the soil, became the victims of unemployment as the new technology intensified, even though it did not originate, economic depressions.) The state assumed more control over the lives of the people as the government gradually increased its regulatory control over business. Higher taxes necessarily followed the expansion of government activity and more and more persons identified themselves with political or economic groups in order to exercise more control over their affairs. ~

Resistance to Change. Those who promote engineering achievement encounter many types of resistance, not all of which are economic in character. Some resistance is just plain inertia.

¹ The term "technology" is used here to include chemistry, physics, and other physical sciences along with engineering as such.

Hard work may be required to make a change. Sometimes psychological factors of habit and fear and the tendency of groups to coerce their members to uniformity are forces toward resistance to change.) Timid souls always object to a break with the past; frequently they introduce sentimentalism and even religion into their fight for the maintenance of the *status quo*. The introduction of the steam locomotive was opposed in England because some people thought it would interfere with fox hunting and with the peace of the countryside. When the train was finally introduced, its speed was limited by law to 4 miles an hour on the pretext of safety. Arkwright's spinning jenny met the resistance of both workers and landowners, the former because of the fear of loss of employment, the latter because they did not wish to be taxed to pay for the unemployment. Chauncey Depew, one-time president of the New York Central Railroad, warned his nephew not to invest money in Ford Motor stock because he thought "nothing had come along to beat the horse." The first Packard car lent some support to this view when it put a whipstock on the dashboard as standard equipment. In 1840 the bathtub was denounced as an "epicurean innovation from England designed to corrupt the democratic simplicity of the Republic."

(Resistance to change frequently is financial.) Turnpike companies objected to free roads because they profited from tolls. Owners of stagecoaches opposed railroads because of the fear of loss of business. Prefabricated houses have met the resistance of financial institutions who hold mortgages on existing dwellings. The scrapping of new equipment is costly and bankers often oppose it. (Where competition can be controlled through monopoly devices there is less pressure for change.)

(Some resistance to change has been fostered by the skepticism of fellow scientists and of the public generally.) Thus in 1880 the English scientist Osborne Reynolds advocated the use of rope drives in preference to electric-power transmission, which he considered to be impractical. Edison's invention of the incandescent lamp was referred to by the then president of Stevens Institute of Technology as a "conspicuous failure." The *Popular Science Monthly* rebuked Langley for suggesting that air transportation would become common. In 1903, Simon Newcomb, dean of science, wrote: "May not our mechanicians have to admit that aerial flight is one of that great class of problems with which

man can never hope to cope and give up all attempts to grapple with it?"

Engineering and "Economic" Production. A new invention is useless until the cost of the new method has been reduced sufficiently to permit it to realize a profit in competition with older methods. Thus electrical engineers could undoubtedly design more efficient transformers than those in operation today if silver wire were used instead of copper; but the construction of such transformers would be so expensive as to prohibit their profitable operation under present conditions. Similarly, mining engineers have shown that present methods of coal mining are inefficient and wasteful. When coal is taken only from the larger veins, the smaller seams often cannot be utilized at all in later years. Thus the present costs of mining small seams as compared to those for large seams of coal may result in the permanent loss of a considerable portion of our coal reserves. The physically more efficient method of utilizing natural resources is not applied in practice because of the economic factor of cost. Mineral production generally is conditioned by two opposing forces: exhaustion versus mineral technology. As richer fields become exhausted and the price of the mineral tends to rise, more money can be invested in mining techniques which permit the handling of low-grade ores at less cost.

When the economic system becomes disturbed and existing equipment is used only at partial capacity, few new inventions are utilized, except to reduce labor costs. In 1932, for example, purchases of industrial machinery declined 74 percent from the annual average for 1919-1929. A return to hand and small-scale production methods, practiced so widely during the depression as a means of providing work for more persons, necessarily curtails the advance of technology. In private industry the shrinkage of markets necessitates the temporary abandonment of mass-production techniques in favor of methods which will yield greater financial return in the face of the declining market.

The lighting of highways by high-pressure mercury lamps depends upon a volume of traffic sufficiently heavy to make special provisions for 24-hour capacity. Likewise, rural electrification programs depend upon a sufficient density of population to enable power to be furnished at rates within the means of the persons to be served. If both sets of economic factors are satis-

factory it is possible to combine highway lighting and rural electrification. There are many arguments, both technical and economic, for the electrification of railroads, but the change is so costly as almost to double the capitalization of a road, and this is an economic consideration which must not be overlooked. Modern electric light is estimated to save a million dollars daily. The tungsten required for making bulbs would not represent a value, at the mine, of more than \$200,000. Under these conditions it would be feasible, if it ever becomes necessary, to pay a much higher price for tungsten or for a substitute if tungsten is not available.

The prices of raw materials have an important bearing upon chemical processes. During the World War acetone was made from corn. As the price of corn rose, cheaper fermentable sugars were sought, and now the price of molasses is low enough to permit its use instead. Produced concurrently are several alcohols. One of them, butyl alcohol, originally had no use, but the chemical industry canvassed the possibilities of this cheap raw material with the result that it is now used as a solvent in the manufacture of a lacquer which has revolutionized the coating industry.

The case of chlorine is an interesting one from the standpoint of chemistry and economics. Chlorine was originally a relatively valueless by-product obtained from the manufacture of caustic soda by the electrolysis of brine. At times the chlorine was a drug on the market. Then new uses were found for it in various chemical processes, such as the sterilization of water. The petroleum industry began to use more chlorine. Meanwhile other uses developed for caustic soda, such as the making of rayon, but the demand for chlorine outstripped the demand for caustic. The main product and the by-product had in a sense been reversed. Then the search began for an economical way to produce chlorine. Research had shown that this step could be accomplished by treating salt with nitric acid. Salt was cheap but nitric acid was expensive. However, the by-product in this process was not caustic soda but a salable grade of sodium nitrate, usable in agriculture. At this point research in metallurgy bridged the gap by providing stainless steel; this permitted the making of equipment which would not be attacked by nitric acid, thereby reducing its cost. |

Historical Interdependence of Economics and Engineering.—

(The close interdependence of economic and engineering factors may be seen clearly in the parallel historical development of our economic and technological heritage.) When Alexander Hamilton made his famous "Report on Manufactures" in 1791 the first steam engines were just being introduced into factories to propel Cartwright's crude spinning machines. Ships still depended upon wind power. Goods were moved overland by beasts of burden. Only a few inventive minds had any vision of steam railroads. Only a few small newspapers were being published. The time was over a half century too early for Morse's first crude telegraph. The small manufacturers of leather goods, snuff, paper, hair powder and gunpowder, and copper, brass, and iron products complained bitterly of a "want of capital" and a "shortage of labor," as well they might, for the small savings of the people permitted little capital accumulation and most persons were engaged in agricultural pursuits. When the Constitution was signed (1787), there were only three successful banks in the whole country. The surplus food produced by nineteen farmers was sufficient to feed only one city resident. Today, nineteen people on farms can produce enough food for fifty-six non-farm people, plus ten living abroad. Within the past 100 years the proportion of all gainfully employed persons engaged in agriculture has dropped from about 75 percent to 20 percent. Nevertheless, the ever-present farm problem, in respect to some products at least, still seems to be associated with overproduction.

In 1810 the total value of gold "panned" in the United States was only \$2,463, a quantity too small to support a gold-money system. Fifty years later the annual production was valued at 46 million dollars while today it is well over a billion. The old-time prospector has given way to the science of exploration. In 1840 only 100 tons of copper were mined. The price was too high to make its use common. As late as 1870 annual steel production was reported to be only 68,750 tons, an amount sufficient to supply the present automobile industry for only a few days. In 1870 total deposits in banks amounted to a little over 2 billion dollars; 60 years later they amounted to 50 billion. The country as a whole had changed from a debtor to a creditor nation. Industry and trade were expanding. As the tempo of economic

life quickened, changes multiplied; economics and technology were coming closer and closer together.

The twentieth century brought with it new developments of outstanding economic and engineering importance. Perhaps those with the most far-reaching effects are associated with the automotive, aviation, and electrical industries. The late Theodore Roosevelt was commended for his characteristic courage when he rode in an automobile in 1900, but today there is one automobile for every five persons. In 1903 Orville Wright kept his first plane aloft at Kitty Hawk for 59 seconds, while in 1937 over 2,300 airports and landing fields were in use and more than 549 million passenger miles were flown by transport planes in the United States; though still less than one percent of the miles traversed by the railroads, air mileage is increasing at a rate so rapid that no one can predict the outcome. From 1914 to 1925 the total sales in the radio industry increased more than 22,000 percent. Radio enormously increased the audience for the spoken word. Whereas only a few hundred persons were able to hear Lincoln's address at Gettysburg, millions now can assemble about their own firesides to hear a talk by the President of the United States. Today the power of the spoken word in religion, in politics, in education, in business, and in every phase of our lives is exerting a tremendous influence. Tomorrow, when television will allow us to see as well as to hear, what new forces of control will bear upon our lives?

Meanwhile, progress was being made in the extension of the more homely things. From 1913 to 1927 the number of bathtubs in use among the non-farm population increased over 9 million. Residence telephones increased over 5 million, and the number of domestic light and power customers increased over 13 million. So great has been the turn to electricity that the United States now uses as much electric power as all the rest of the world combined. In 1920 only 10,000 electric household refrigerators were sold, but by 1934 the annual sales had risen to 1,390,000 units. Although Edison produced the first commercially successful incandescent electric lamp in 1879, it was not until 1906 that the number marketed reached 57 million. In 1935, however, the number sold was 413 million, each lamp costing only half as much to operate and giving four times as much light as did

the early globes. Of the 21,285,000 homes wired for electricity in 1936, irons were used in 97.2 percent, toasters in 49.8 percent, washing machines in 48.8 percent, sweepers in 48.3 percent, clocks in 41.1 percent, refrigerators in 34.2 percent, and ranges in 6.8 percent.

The "Next" Hundred Years.—What does the future hold in store? It should be clearly realized that centuries, decades, and years are merely devices to measure intervals of time; progress is not confined to calendar arrangements. A new hundred years begins at any time. Important economic changes can take place either as a result of one outstanding development, such as the gasoline-driven motor vehicle, or as a result of several related or unrelated developments. The Subcommittee on Technology of the National Resources Committee believed the following inventions and processes would be likely to have the most far-reaching effects: The mechanical cotton picker, air-conditioning equipment, plastics, the photo-electric cell, artificial cotton and woolenlike fibers made from cellulose, synthetic rubber, prefabricated houses, television, facsimile transmission, the automobile trailer, gasoline produced from coal, steep-flight aircraft, and tray agriculture. New and equally important developments may be added to this list in the near future. At any time some private inventor or laboratory research worker may announce a discovery which will affect economic relationships profoundly and which in turn will be greatly influenced by economic adjustments.

✓III. ENGINEERS MUST BE ECONOMISTS

Engineering and economics are closely related through the life experience of engineers. These experiences indicate that many engineers sooner or later assume positions which require a working knowledge of economics. Engineers not only have risen to the head of engineering firms, but also have been made presidents of manufacturing corporations of many types, of transportation and shipping agencies, stores, banks, trust companies, non-profit foundations, universities, and other institutions. Engineers are, or have been, governors, members of state legislatures, members of Congress, and members of the cabinet and have held many other important political posts, including the presidency of the United States.

Engineers in every city in the world occupy positions in designing, estimating, supervising, producing, selling, and servicing activities which require them to deal with such economic matters as prices, wages, labor relations, interest rates, bonds, stocks, balance sheets, taxes, banks, money, credit, insurance, economic indexes, business cycles, social security, or government control, to mention only a few of an almost endless and ever-changing list of items which are encountered in the conduct of modern business. According to the Alfred P. Sloan Foundation of New York City, the chance that a person with engineering training will rise to an executive position in industry is now thirty times as great as that enjoyed by non-engineering graduates.

Every engineer, regardless of his position, is a consumer just as he is a citizen and, presumably, a voter. If the engineer is to discharge the duties of a citizen intelligently, it is necessary for him to be a well-informed consumer with an understanding of the true "inwardness" of the economic system in which he lives; and it is for this reason, finally, that the engineer needs to be familiar with economic analysis. ✓

Problems

1. "Boulder Dam and the Great Pyramid of Egypt have practically identical volumes. It is estimated by historians that some 100,000 men labored 20 years in the construction of the pyramid, while only 1,200 men in less than 2 years built Boulder Dam."

In a statement of about 200 words enumerate the *general* causes which you think explain the change in construction efficiency represented by these two projects.

2. "The money spent to build 100 miles of roads in 1922 would have built 170 miles in 1932." Explain.

3. "Civilization would have advanced more had the Ancients been more interested in metals and less in philosophy."

"Steam turbines do not fit in with the Age of Pericles and Fords in the Roman Forum would be the height of incompatibility."

With which of these statements are you least in agreement? Are the statements inconsistent with each other?

4. It is estimated that, on the average, Americans now travel about 2,000 miles per year, about four times as many miles as in 1920. List some of the many things which have been changed by this increase in travel.

5. If all bituminous coal mined in 1935 had been subjected to low-temperature coking, it might have yielded 100 million barrels of motor fuel—but one-fourth of the domestic demand—but it would have been necessary to dispose of some 280 million tons of low-temperature coke.

What economic factors made it impractical to convert the coal? What factors might change the situation at some future time?

6. "Adequate fuel storage at power plants may prevent emergency shut-downs; it smooths out demand curves at mines and makes it more difficult for workers to win a strike." Just how may this result come about?

7. "The early conception of fertilizer was to make two blades of grass grow where one grew before; now it is to make a crop yield \$2 instead of \$1." Wherein is the difference between these two conceptions?

8. What types of engineering techniques are involved in TVA? What general economic problems have been solved? What new problems have been created?

References

ELY, RICHARD T., and FRANK BOHN: "The Great Change," Thomas Nelson & Sons, 1935.

Federal Communications Commission: "Patent Study of Bell Telephone System," Special Docket No. 1, 1937, Washington, D. C.

FURNAS, CLIFFORD C.: "The Next Hundred Years," Reynal & Hitchcock, 1936.

GILFILLAN, S. C.: "The Sociology of Invention," Follett Publishing Company, 1935.

HAMMOND, J. L., and BARBARA HAMMOND: "The Rise of Modern Industry," Methuen & Co., Ltd., 1925.

HATFIELD, H. S.: "The Inventor and His World," Kegan Paul, Trench, Trubner & Co., Ltd., 1933.

MACIVER, R. M.: "Civilization versus Culture" in *University of Toronto Quarterly*, Vol. 1 (1931-1932), pp. 316-332.

MUMFORD, LEWIS: "Technics and Civilization," Harcourt, Brace & Company, 1934.

National Bureau of Economic Research: "Economic Tendencies in the United States," 1932.

SPENGLER, OSWALD: "Der Mensch und die Technik," Beck, 1931.

WOLF, ABRAHAM: "History of Science and Technology in the Sixteenth and Seventeenth Centuries," George Allen & Unwin, Ltd., 1935.

CHAPTER II

BASIC CONCEPTS

Economists have not developed a special vocabulary of scientific terms in the manner of the physical sciences. Rather they have used terms common to everyday speech, but special meanings have been attached to these terms. Therefore the student of economics must familiarize himself with these particular meanings if he is to understand economic analysis.

The Nature of Definition.—Careful definition and consistent use of terms are aids to clear thinking and thus to the prompt communication of thought. When a person is confronted with a problem, either theoretical or practical, he may find himself confused either because he does not see the premises clearly or because he does not know exactly what it is about which he is thinking. In the second case he may think more clearly if he can define the words by means of which he attempts to express his thought (see Probs. 11 and 14). When words can be defined, they can be understood. A word is understood when its users know what it is to which the word refers or when they can use it significantly in combination with other words.

A definition is a simplification of the form: We are going to use *X* to express what *ABC* expresses. For example, the term "second cousin" may be defined:

"Second cousins" are "those whose parents are first cousins."

"First cousins" are "males or females of which one parent of the one is brother or sister of one parent of the other."

Since the meaning of the term "parent" is well known, the chain of definitions need not be carried further. Thus a definition is a declaration that a certain symbol is to have the same meaning as a certain other combination of symbols whose meaning already is known.

Meaning of "Economics."—Scarcity is the basis of economic problems. Prices arise because men desire commodities which are scarce. Thus *economics* may be defined as the social science that

deals with human interests from the standpoint of price. In terms of another common definition, economics is the social science that deals with the wealth-getting and wealth-using activities of man. Either statement involves three important points which require further examination.

Economics, in the first place, is a *social science* and not a physical science. It is concerned with the relations of man to man and of man to nature, rather than with the physical, chemical, or biological laws of nature themselves. Principles of economics are built in part upon physical laws, of course; but there would be no problems of economics unless men themselves were present.

Economics, in the second place, is a *social science* for the reason that it deals largely with groups of men rather than with individuals. Present-day men are economically interdependent. The high degree of specialization in modern life makes each man dependent on his neighbors for the great majority of goods and services which he consumes and so involves him in the economic problems of the community as a whole.

Economics, in the third place, deals largely with the problem of values, or *prices*. Each science is known by its point of view. Mechanics measures an engine in terms of horsepower, and dietetics measures an egg in terms of calories. Economics measures the value of both engines and eggs in terms of dollars. Although such aspects of economics as consumer buying habits or employees' working conditions cannot be measured directly by prices, most economic questions really involve value problems.

Utility.—Individuals desire goods and services because they think that wants thereby will be satisfied. It makes no difference whether the wants in question are serious, frivolous, or definitely harmful or whether the particular commodity or service actually will serve to satisfy this want. The *belief* of the consumer that the expected satisfaction will result is sufficient. Thus *utility* may be defined as that feeling on the part of a consumer which leads him to believe that an article or service will satisfy his want. Goods or services which lack utility will be desired by no one; the presence of utility means the presence of this belief in power to satisfy a want. Some goods—as capital equipment—it may be noted, possess only *derived* utility since they satisfy wants only indirectly by aiding the production of consumers' goods.

Free and Economic Goods.—Some goods and services may be present in such large quantities that all possible desires for them are filled. Such commodities are called *free goods* since no one would pay a price to obtain an article so plentiful that all desire for it has been met. Water, sunlight, and fresh air usually are free goods in nature but not always in urban communities. Water meters and zoning ordinances indicate that city dwellers must pay for these services. Thus most commodities are *economic goods* and command a price, because the supply is insufficient to meet the potential demand. *Scarcity*, therefore, is the characteristic which separates economic goods from free goods and which gives rise to all the problems of economics. The need to economize, and the science of economics, would disappear if all things were sufficiently plentiful to meet all men's desires for them.

Value.—The outward expression of a belief that a commodity will satisfy a want takes the form of the *valuation* of that commodity in terms of other goods. Value is the economic phase of a person's reaction to a feeling that a commodity or service possesses utility. This value may be expressed in three ways. *Use-value*—which cannot be measured accurately—is related solely to utility. The higher the utility, the greater the use-value. If a starving man is offered the choice between a loaf of bread and a diamond he is likely to select the bread because of its greater use-value. If he also is given the opportunity to sell the diamond, however, he may select the stone instead because it will purchase many loaves of bread. In this case it is the *exchange-value* of the diamond, rather than its use-value, which determines his choice. Exchange-value is the power of a commodity or service to command other goods and services in exchange. These two kinds of value are not necessarily related. As an extreme example, a newspaper may have no use-value for a blind newsboy but it does possess exchange-value for him since he may obtain in exchange for it other things which promise use-value for him. Finally, if the exchange-values are expressed always in terms of the same commodity, *i.e.*, money, they are called *prices*. Thus use-value is related to utility; exchange-value is based partly upon the final consumer's anticipation of use-value; and a price is the expression of exchange-value in monetary terms.

The Engineer and Value Problems.—Value relations are exceedingly important from the engineering viewpoint. Every

type of engineering activity, aside from its purely technical aspect, must be tested in terms of economic values. The question: Will it pay? must be answered in the affirmative if the activity is to be undertaken. This statement is as true of the design of a fountain pen as of the design of a skyscraper; as true for an elevator as for a nationwide railway system; as true for a radio tube as for a gigantic power plant. The principle of comparative values permeates every phase of modern industry. The most profitable methods are sought everywhere.

The engineer, however, frequently recognizes only use-values and ignores exchange-values in his discussion of *social* problems. Thus in economic analysis he is likely to favor the continued production of an article as long as additional units will be useful to anyone and so overlooks the fact that present-day production can continue only if exchange-values are high enough to make the receipt of profits seem probable. Capitalism has no interest in use-values unless they happen to result in exchange-values which will yield a profit.

Engineers also experience some difficulty with the concept of the "fair price" or the "just price." Some students of economics feel that an article always should sell at a "fair price," which seems to mean that the producer should receive neither more nor less than a "fair profit." These terms were in common use in the Middle Ages when cost of production and selling price, types of employment, and standards of living, were fixed by custom and were stable over long periods of time. Our modern economic system, on the other hand, is so much subject to continuous change that "just price" and "fair profit" today frequently are meaningless terms. If a seller can exact a high price, or a buyer a low one, that is his advantage, for an individualistic economic system presupposes no limits upon a person's economic activity except those imposed by the forces of free competition. Thus the present application of "fair price" is limited largely to the "fair return" which public utilities are entitled to receive under public regulation (see Chap. XVI). Any other use of the term is apt to be ambiguous.

Non-economic Factors.—Although there is much reliance upon the profit motive in our economic system, it must not be assumed that all of man's activities are governed entirely by economic considerations. Esteem of associates, patriotism, fear, pity, and

love all play their parts. Even the choice of an occupation or profession is frequently conditioned by non-economic factors. For example, about 11,000 students admitted to curricula in thirty-two engineering institutions indicated that the basis of their decision to undertake the study of engineering was as follows:

Reasons for studying engineering	Percent
Definite appeal of engineering.....	28.6
Supposed aptitude for the work.....	17.4
Expectation of good living.....	15.0
Advice.....	13.6
Preparation for life work.....	13.3
Work of associates.....	10.8
Other.....	1.3
Total.....	100.0

These bases are all reasons for deciding upon a given course of action, but only one of them—expectation of good living—falls directly within the scope of economics. The others are technical, sociological, or ethical. While these reasons may sometimes be more powerful than the economic factor in determining man's social behavior, the economist is interested only in the economic effects, if any, of the non-economic factors.

The Viewpoint of Economics.—The study of economic problems may be undertaken as an exercise in pure science in which the aim is to learn *how* the economic system operates and *how* economic principles apply to particular problems. The pure scientist as such would make no attempt to express any judgment as to what is *best* for individuals or for society as a whole. He would attempt to explain *what* would happen under various conditions but would refrain from any suggestion as to the course of action which seemed to him most desirable under those conditions. He would leave to other persons the determination of the policies that should be undertaken.

The welfare economist, on the other hand, would attempt to carry the analysis a step farther. He would express an opinion as to the best course of action to be pursued after he had undertaken the purely scientific analysis of what would be most likely to occur under a given set of conditions. Thus the welfare economist would indicate the solution to a problem which he believes would be the best one under given circumstances. The basis for his judgment must be "the greatest good for the greatest number" if

his personal bias is not to influence his decision. Expressions of this social viewpoint will be found occasionally throughout the following discussion.

Wealth.—National or social wealth may be defined as the stock of scarce, material, useful, and transferable goods in existence at a given time. The goods must be scarce and useful if they are to have economic value, and they must be material and transferable if the definition is to have social meaning. A share of stock or a bond issued by the United States Steel Corporation, for example, cannot be classed as social wealth because the physical property upon which either has been issued actually constitutes the wealth. The securities represent property rights—*personal* wealth—which would involve double counting if they were added to the physical property in computing the *national* wealth. Personal services, while highly essential in producing wealth or utility, cannot be counted as part of the national wealth of a country, unless men are slaves and are reckoned as part of the wealth of their owners.

Capital.—The term “capital” may be used in a number of different ways. In the most general sense, it is synonymous with wealth and includes extracted raw materials, machinery and equipment, and finished products of all kinds not yet worn out. In the narrow sense, capital refers to the goods used not for final consumption but for further production. Thus we may speak of capital equipment or producers’ capital. A distinction sometimes is drawn between *producers’ capital* and *consumers’ capital*, wherein the latter term refers to durable consumption goods in the hands of final consumers but not yet used up. Thus a motorcar operated for business purposes is classed as producers’ capital. If the car were in the hands of the dealer awaiting sale it would be classified in the same way, but if its owner uses it for pleasure and not business it is to be considered as consumers’ capital.

The value of producers’ or consumers’ capital usually is expressed in dollars, but care must be taken to avoid confusing capital goods—which assist labor in the production of the utilities desired by consumers—with “capital” as a fund of dollars available for investment in various kinds of capital goods or with “capital” as the money value of the capital goods themselves. Everyday speech provides many examples of loose usage of these terms which would be quite unacceptable in any scientific discussion of the concepts.

Industries often are classified according to the chief type of goods which they produce. Thus one class includes the capital goods industries and another the consumers' goods industries. A third classification, the service industries, provides such "public utility" services as electric light and power, natural or artificial gas, water, telephone and telegraph, and transportation. Finally, the fourth class is composed of the extractive or raw-material industries in which are included agriculture, mining, forestry, and fisheries.

Income.—From the individual's viewpoint, income usually is regarded as the flow of dollars received from investment or labor. Social income, however, refers to the flow of goods and services which the economic system makes available for final consumers. Income thus is to be distinguished from wealth because the latter is a *stock* of goods in existence at a given time while income is a *flow* over a period of time; and social income, although often measured in dollars, actually is composed of the commodities and services which comprise the *real* income of the nation (see "Deflation," Chap. III).

Standard of Living.—A standard of living may refer to a bare minimum of the requirements for life, a "subsistence" standard. It may be a "living" standard which permits the enjoyment of some of the finer things of life, or it may be an ideal standard that can be attained perhaps only at some future date if all goes well. Standards of living are related to the real or social income of a nation and to the way in which that income is divided among its members. An individual's standard of living may be expressed as follows:

S = the *standard of living* (which may be regarded as a measure of the consumers' destruction of the various uses of goods and services per unit of time).

P = the *national product* during a given period of time. The national product is composed of two parts: (1) the *goods* consumed, including not only the articles completely used up in the period, but also a portion of the useful life of more durable goods; and (2) the *personal services* of others utilized during the period.

T = the *leisure time* available in which to enjoy the consumption of goods, the utilization of personal services, and the pursuit of the cultural arts.

E = the *energy drain* of the labor performed in order to secure P and T .

We may say, then, that

$$S = f\left(\frac{P, T}{E}\right) \quad (1)$$

wherein we wish to maximize P , T and to minimize E . Some persons fail to analyze correctly problems involving standards of living because they assume that

$$S = P$$

and therefore assert that

$$2S = 2P$$

It should be evident, however, that this last expression ignores the important elements T and E . Thus an attempt to expand P by reducing T and by speeding up the workers—the “stretch-out”—might not increase S in proportion to P . Indeed, S actually might be reduced in spite of the fact that the stock of goods P available for consumption thereby was increased.

Waste and Social Efficiency.—Some economic activities may be inefficient or actually wasteful from the social point of view. The sale of stock in worthless enterprises, the destruction of crops to raise prices when many persons live on inadequate diets, the sale of used motor oil as a standard product, the dilution of medicines, and plain burglary are all economic activities if they yield income by which some persons may secure economic goods, but they do not increase the social income.

In our present system a certain amount of activity is not only inefficient and wasteful but sometimes is actually detrimental to society. Aside from the waste of *idle* manpower that on any given working day is doing nothing and of *excess* manpower required because the best methods are not utilized and waste of *natural resources* in our country's history due to the ills of acquisitive individualism, there is *war*—the most indefensible of inefficiencies. Estimates of the over-all economic efficiency of the United States fall as low as 50 percent, so great are the combined wastes in our economic system. Whatever the exact amount may be, the fact remains that the loss means a much lower level of social efficiency, and consequently a much lower standard of living no matter how the national income is divided among the people, than otherwise might be enjoyed by the nation's citizens.

Kinds of Efficiency.—Because economics is a social science it refers not to an individual living by himself but to a group of such individuals acting together. Thus such problems of individual efficiency as are met in time-and-motion studies belong in the field of industrial management, which itself is but a small segment of the broader field of economics. When we consider the problems of a group instead of those of an individual, we find that the meaning of efficiency depends upon the interests of the group involved. Thus *technical* efficiency is greatest when a given task can be performed with the least expenditure of time, energy, and materials. *Business* efficiency is greatest when the enterprise secures the maximum net profit. Maximum profit, however, may be obtained not only by a minimum expenditure of time, energy, and materials, but also by limiting output through reducing the use of equipment, curtailing employment, withholding goods from market, suppressing patent uses, and so on. Finally, *public* efficiency is greatest when the mass of the population has the highest possible standard of living. A new process or a new invention, such as a cotton-picking machine, may happen to meet the test of business efficiency as well as of technical efficiency, but its immediate adoption on a wide scale may not be in the best interest of the public because men may be thrown out of work and so may create a relief problem which might offset any gains in other directions. The engineer who studies social problems from the economic viewpoint should take pains to make sure that he preserves the public-efficiency, or general welfare, attitude toward these questions (see Prob. 9).

Relative Efficiency.—Man's activity in prehistoric times was devoted to the task of securing the barest necessities of food and shelter. During the Middle ages, a very few, the nobility, lived in comparative ease and luxury while the rest of the people were sunk in direst poverty. Today the people of the United States probably live in greater luxury than do those of any other country; yet unemployment, poverty, and suffering still are present in every American community. Thus the efficiency of the economic system measured in terms of the standard of living S constantly has been raised, century after century, but it still is very much in need of further improvement. As far as wealthy persons are concerned, S is more than adequate; but for those in the lower

income classes *S* still is very far below what we might have every expectation of finding it to be (see Probs. 10 and 18).

Two or more ways of securing a given result in economics often may be discovered. Thus one of the problems to be faced is that of the *relative efficiencies* of these alternative methods. The economic system at present found in the United States, for example, is designated as capitalism, while that in Russia is variously described as socialism or communism. Here are two different types of economic system whose methods of operation are markedly dissimilar, yet both attempt to satisfy the economic wants of their citizens. The relative efficiencies of these two types must be considered, although it may be impossible to reach a definite conclusion as to the more efficient system. The problem is complicated further because additional types of economic system also must be included in the analysis.

Types of Economic System.—Operation of the economic system may take place in several ways, according to the degree of *automatic control* exercised over economic activity. The terms now to be discussed are used very loosely in everyday speech; thus the student must take pains to understand the specific usage here explained to avoid later errors in terminology.

The basic distinction between types of economic system is that between *capitalism* and *collectivism*. Both terms have multiple meanings. Capitalism may be used as a phrase to describe the *method* of production. In this sense capitalism is to be distinguished from direct hand production. The employment of power tools, machinery, and equipment—the use of labor to produce capital equipment which then will turn out consumption goods—is the essence of this meaning of capitalism. Such “roundabout” production clearly is quite different from the direct hand-labor method, wherein men produce goods without the use of tools or machinery.

The second meaning of capitalism refers to the *ownership* of the means of production. Thus we speak of the capitalistic system when we think of the private ownership and operation of the capital equipment of the nation for personal profit. This system is based upon acquisition, competition, and rationality. Acquisition entails the search for private ownership and management of property for personal gain; competition results because each person is free to do as he wishes with his property, so that several

individuals may use their capital equipment to produce goods for the same market; and rationality involves planning the use of property for the purpose of maximizing profits. A by-product of this capitalistic system is the development, where acquisition is absolute, of a particular attitude of mind which judges the importance of everything in terms of its serviceability for economic profit. Thus a human being comes to be regarded merely as labor power, nature as an instrument of production, and all of life as one great commercial transaction. The ethical and humanistic values in life tend to be thrown into the discard and acquisition degenerates into economic unscrupulousness and ruthlessness.

Collectivism also may be used in two ways. The term may refer, for example, to *business methods*. Thus the modern corporation represents a high degree of collectivism, for many persons pool their capital and labor under the collective management of the corporation. In this sense the term deals with the antithesis of the one-man enterprise which has no employees.

In the second place, collectivism may refer to the *national economy* and so stands opposed to individualistic capitalism. Here the term is a general label for a condemnation of capitalism as basically unjust and for comprehensive schemes of authoritative control in which property is owned collectively and not individually. This system is based upon a planned economy which is non-automatic in operation.

It is to be the second meaning of each of these terms which we shall use hereafter. Capitalism and collectivism thus refer to opposing systems for the ownership of property and so to the control and operation of the economic system. Both systems may use capital equipment in production, and both may employ large-scale "collective" business enterprises, but the ownership of the property remains the distinguishing characteristic.

Automatic and Semi-automatic Systems.—Under the general heading of capitalism—of automatic operation of the economic system controlled by the forces of competition—we may distinguish three subdivisions. The first of these is *anarchism*. Anarchists desire to establish justice and equality in all human relations by the complete elimination of the state. The anarchist believes that men naturally are good and that the state, since it must dominate the lives of individuals, therefore is bad. In

practice anarchists often favor violently revolutionary methods because the state cannot be eliminated by peaceful means, but these methods are an offshoot rather than an integral part of the theory of anarchism. Students frequently confuse anarchism with autocracy, which means the absolute rule of a few, whereas the anarchist desires a system in which no person rules another; or they may confuse the theory of anarchism with nihilism or other violently revolutionary programs.

The second subdivision may be described as *individualism* or as the policy of *laissez faire*. The individualist has little respect

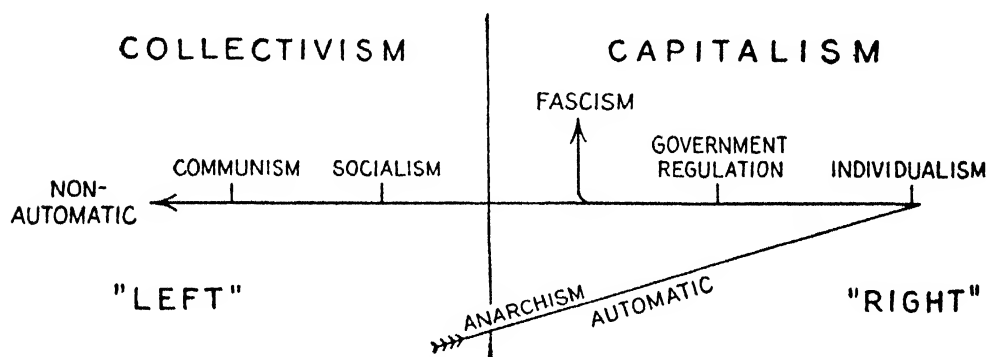


FIG. 1.—Types of economic system arrayed.

"Right" and "left" in the political sense refer to conservative and radical viewpoints. In moving "left" we go from automatic to non-automatic operation of the systems. Anarchism is radical but fully automatic and may be either capitalistic or collectivistic.

for tradition or authority and emphasizes instead the supreme worth of the individual. Thus each person is to do as he pleases and the economic system is one of free competition and of exchange of goods and services for what they will bring in the market. The individualist declares that the economic affairs of society in the main will take care of themselves if no one having coercive authority attempts to interfere with operations as determined by the individual actions of men. A bare minimum of government, however, is regarded as necessary to prevent foreign aggression and to preserve law and order, but it is to refrain from any interference in business activities. It is upon the bare existence of government, therefore, that the individualist differs from the anarchist.

The third subdivision, which may be described by the term *government regulation*, stands almost on the border between capitalism and collectivism. Although persons favoring this

policy believe in relative freedom from government interference, they think nevertheless that uncontrolled business activity often causes much harm to small businessmen, consumers, laborers, and others. Thus they favor *regulation*, but not ownership or production by the state, of foods, sanitation, working conditions, public utility rates, and many other activities which modern governments have assumed. This position is the one most typical of the economy of the United States today. These three subdivisions of the broad field of capitalistic production have been listed in the order of an increasing degree of interference by government in the lives of its citizens, and therefore in order of decreasing automatic control of economic activity by the forces of free competition.

Fascism is a term which does not fit directly into this series because it is a political rather than an economic way of life. In order to avoid confusion, however, it must be related to the other terms. The fascist is quite the opposite of an individualist, for he is a vigorous nationalist, but he remains a capitalist. Fascism declares that it is the duty of the individual to elevate himself to the heights of the national consciousness and to lose completely his own identity in it. He has individual rights only in so far as they do not conflict with the needs of the state, but private property rights though curtailed are maintained, so it is a system of capitalism in which most of the citizens must obey the leaders (dictators) of the authoritarian or "totalitarian" state.

Non-automatic Systems.—The non-automatic, collectivist economy may be divided into socialistic and communistic systems. While a superficial distinction sometimes is drawn between these two types on the basis that the first tends to be evolutionary and the second often is revolutionary in character, a more basic difference is the extent to which governmental authority is invoked to control the economic life of the individual. *Socialism* thus involves collective ownership and operation of the capital equipment, and perhaps of the other means of production, of the nation. Although there are many types of socialism, such as state socialism, in which the political government operates productive enterprises, or cooperative socialism, in which the workers in an industry run the enterprises, most of these types would maintain the system of wage payments for services rendered by the individual so that he could continue to spend his

earnings as he sees fit, much as he does in our present economic system.

Communism, on the other hand, involves a more complete social control of economic life, including common ownership of some or all consumers' goods as well as producers' goods, in order to permit a more equitable adjustment between individuals and to reduce to a minimum the operating inefficiencies in the economic system. "From each according to his ability; to each according to his need" might well express the communistic ideal, in which case private property in wealth and income would be abolished in favor of the common ownership and use of all but the most personal of goods.

Capitalistic and Collectivistic Methods of Control.—All these types of economic system attempt to reach the same goal, namely, the performance of certain economic functions, but by way of different roads. Any economic system must provide for the *production* of goods in the quantities and of the qualities desired by the final consumers; it must permit the *exchange* of goods when specialization leads each producer to concentrate his efforts upon a single task; and it must *distribute* the goods among the members of the population according to some scheme which provides either for equal or for unequal shares in the national product.

In unregulated capitalism the controlling mechanism is the competitive search for maximum personal income and satisfaction. Thus men produce more of one article and less of another, according to the amount of profits which they anticipate will be received from one line of activity as compared to those expected from another line. Thus rising or high prices indicate relative scarcity, point toward possible profits, and lead to greater production; low prices suggest possible losses and may curtail output. The determination of the goods to be produced depends upon the purchasing power of consumers as well as upon their desires; thus the more urgent needs of a community are not always the first to be satisfied, because money income may be distributed very unequally so that the less pressing wants of the wealthy may be met instead of the more urgent wants of the poor.

In collectivism, on the other hand, production is planned by some authority instead of being directed by the "blind" forces of competition. Distribution of goods may be upon the basis of prices as at present, or it may be handled as a problem in rationing, by food cards for example (see Prob. 17). Clearly the dis-

advantage of rationing is the inability of anyone to devise a planned distribution of goods which will satisfy everyone, but the disadvantage of the price-competition method is the highly inequitable results sometimes attained if incomes are not approximately equal (see Prob. 15). While one weakness of planned production may be that some person or group must determine just what shall be produced and so cannot meet the wishes of everyone, the freely competitive system of capitalism leads to the production of goods because it is profitable to make them and not because the goods are particularly necessary or will reach the hands of those who need them most.

The basic concepts discussed in this chapter provide the nucleus about which will be grouped additional definitions of terms as the treatment of economic analysis progresses. These definitions will be presented when the new terms are to be utilized. The second step in preparation for the analysis of economic problems is presented in the following chapter and involves an examination of the research methods used by social scientists. A few of the more outstanding problems in social analysis will be noted so that the student may understand some of the methods and limitations of economic theory.

Problems

9. "Efficiency is a technical test of work (output divided by input). Economy is a human test of work (product divided by cost). Efficiency can never exceed 100 percent, while economy normally must exceed 100 percent. Therefore efficiency should be contrasted with economy instead of identified with it." Do you agree? Why?

10. "Nothing should be done by man which can be done by a machine." Discuss.

11. The Bureau of the Census defines "family" as one person or a group of persons, not exceeding ten, who eat at the same table. The term "dwelling" is so defined that families in a multiple-family residence who live one above the other are enumerated as occupying a single dwelling, while families separated by a vertical fire-wall occupy separate dwellings. Are these definitions of significance for an engineer who wants to estimate the radio coverage for a broadcasting station? How should the terms be defined for greatest usefulness?

12. Jevons, a noted English economist, argued over a half century ago that English manufacturing supremacy, which was based partly upon an abundant coal supply, would be lost long before the coal supply gave out. Why? Would the same argument apply to the United States?

13. Would you favor a 15-year moratorium in science to give opportunity for our social and moral ideas to catch up with the progress of invention?

14. Define "farm" and "farmer" from the Census viewpoint so that the Census enumeration would be useful to an agricultural engineer concerned with problems of land utilization and urban and farm population densities.

15. "If each person does the thing that will give him the most money, total income will be at a maximum. Therefore, the way to secure the highest standard of living for the country as a whole is for each of us to follow his own interests, irrespective of others." Discuss.

16. Suggest how each of the following might affect economic conditions in the United States: an English campaign to import more goods from their dominions; a war in China; a new, cheap source of power supply in the United States; the breakdown of the French money system.

17. If the potato crop of a communistic economic society which had no commerce with other communities were to fall off one-half, how would they regulate the consumption of potatoes for the following year? How is it done in our economic system?

18. "From the national viewpoint money-making is a means toward making goods; from the individual viewpoint making goods is a means toward making money. From the national viewpoint the engineer is the central figure in production; in practice he takes orders from the business man. A community is well off in proportion to its efficiency in producing a current supply of necessities, comforts and amenities of life; an individual is well off in proportion to his efficiency in getting a money income."—From an address by Dr. Wesley Mitchell before the A.S.M.E.

Can you make the same point in different words? What are some of the consequences of this practical subordination of our common interest in making goods to our individual interest in making money?

References

BURNS, A. R.: "The Decline of Competition," McGraw-Hill Book Company, Inc., 1936.

CASSEL, GUSTAV: "On Quantitative Thinking in Economics," Oxford University Press, 1935.

CHASE, STUART: "The Tragedy of Waste," The Macmillan Company, 1927.

CLARK, J. M.: "Preface to Social Economics," Farrar & Rinehart, Inc., 1936.

"Encyclopedia of the Social Sciences," The Macmillan Company, 1930-1934.

GRANT, E. L.: "Principles of Engineering Economy," Ronald Press Company, rev. ed., 1938.

KIMBALL, D. S.: "Industrial Economics," McGraw-Hill Book Company, Inc., 1929.

PECK, HARVEY W.: "Economic Thought and Its Institutional Background," Farrar & Rinehart, Inc., 1935.

SACKETT, R. L.: "The Engineer: His Work and His Education," Ginn & Company, 1928.

VEBLEN, THORSTEIN: "The Place of Science in Modern Civilization," B. W. Huebsch, 1919.

———: "The Engineers and the Price System," B. W. Huebsch, 1921.

CHAPTER III

METHODS OF ANALYSIS

The arts—such as architecture, painting, sculpture, oratory, and poetry—affect individuals by their influence upon the emotions, while the sciences—such as physics, chemistry, psychology, economics, and the various fields of engineering—attempt, in so far as they affect individuals at all, to secure acceptance upon the basis of logical analysis of facts. The purpose of logical thinking is to reach conclusions, and the process of reaching conclusions is called reasoning. Ordinarily we reason from something which we know to something which, prior to our reasoning, we did not know but which becomes known as a result of the reasoning process. An appeal to the emotions, on the other hand, attempts to influence action without the use of logic. Thus the science of logic deals with the principles upon the basis of which all the other sciences have been developed.

The Proposition.—When an example of reflective thinking is analyzed, it will be found to consist of propositions—either asserted to be true, or supposed to be true—from which other propositions can be inferred. The unit of logical thinking is the proposition, which is a sentence intended to express what is either true or false. Thus we might say, *The income tax is a fair tax*, or, *A whole nation never benefits from a protective tariff*. These statements are propositions.

The Syllogism.—Logical thinking often combines propositions in the form of a syllogism in order to test the logical nature of a conclusion, of which the following simple syllogism is an example:

*If a fair tax is one based upon the ability to pay taxes
and the income tax is based upon ability to pay,
then the income tax is a fair tax.*

Starting from the generalization, *A fair tax is one based upon the ability to pay taxes*, the income tax is asserted to be a fair tax because it falls within the classification *based upon ability to pay*.

Logic is concerned, not with the truth of the basic proposition or generalization, but with the logical "fitness" of the syllogism or other argument built upon this proposition. Thus the foregoing syllogism is logical, whether the basic premise—and therefore the conclusion—is true or false, although most persons would agree that premise and conclusion are true.

The validity of a premise is much more difficult to establish than is the validity of the logic used. The proposition *A whole nation never benefits from a protective tariff* would be overthrown as false if a single instance of a protective tariff could be shown to benefit the whole nation, whereas a list of any number of tariffs which benefit only a few of the persons in a nation fails to establish the certainty that the proposition is true. It is for this reason that conclusions drawn from insufficient data are so treacherous. The non-scientific individual is more prone than the scientist to assert propositions of this dangerous type. Since the expert realizes the difficulty of stating a truth exactly, he often makes use of such phrases as "other things being equal," or says so-and-so "tends" to be the case.

Some Fundamental Laws of Thought.—The validity of logical thought may be tested more readily than the truth of a premise since reference may be made to various fundamental laws of thought, of which some of the leading principles are:¹

1. Principle of Identity: If X , then X and not Y .
2. Principle of Contradiction: X cannot be both true and false.
3. Principle of Excluded Middle: If one of two contradictory statements is true, the other must be false.
4. Principle of Syllogism: If X implies Y , and Y implies Z , then X implies Z .
5. Principle of Deduction: If X implies Y , and X is true, then Y is true.
6. Principle of Substitution: If X contains x , y , etc., then what is true of X is true of x , y , etc.
7. Principle of Tautology: X and X are equivalent to X (reiteration proves nothing).
8. Principle of Association: The order in which propositions are grouped or asserted is indifferent.

Most persons will take these principles for granted, and will agree

¹ A more complete discussion of this topic will be found in L. S. Stebbing, "A Modern Introduction to Logic," Thomas Y. Crowell Company, 1930, Chap. 24.

that a violation of one of these principles is a violation of logical thought, but the heat of an argument may lead these same individuals to overlook some fundamental law of thought and so to assert an erroneous conclusion.

Persuasion and Conviction.—There are a number of ways in which belief in a proposition may be attained. Thus we may believe a proposition because we always have believed it. In such a case the belief must appear to agree comfortably with our interests, for otherwise we would be led to doubt the belief. Authority is another source of belief, either because we are required to believe a certain thing, or because we respect the expert opinion of the person who is regarded as the authority. Regimented belief may well be deadening to scientific progress, while that very progress itself requires an ever larger belief in the expert's opinion because none of us can prove all knowledge independently since the task is too great for a single person. The third source of belief is by way of self-evidence, for some things are said to be obvious and not open to doubt. These three non-scientific sources of belief may be grouped under the heading of *persuasion*, for they are followed by the more gullible persons who believe whatever they hear.

The methods of attaining belief based upon *conviction* are different because they involve a process of inquiry whose purpose is to resolve a state of doubt. Thus the scientific method whose purpose is to produce conviction shows the following characteristics: clearness, relevance, consistency, and cogency. This is the method of logic followed by the investigators in any field of science.

The Scientific Method.—Scientific thinking essentially is methodical thinking since it is controlled and directed thinking. To be successful, controlled thinking must result in the organization of facts which originally were apprehended only as fragmentary and disconnected entities. Organization is achieved by the apprehension of connections which will relate one fact to another, and it is these connections which are expressed as scientific principles. Isolated facts are useless for science. Thus the foundation of scientific method is the attempt to arrange facts in an order which will permit an explanation of the facts in such a way that the explanation may be checked by other scientists. Therefore two problems appear, namely, the deter-

mination of the "true" facts, and their logical arrangement in a useful form.

If scientific principles are obtained from the study of individual facts, the method is one of *induction* from facts to generalizations. When the generalizations have been established, new points may be obtained therefrom by *deduction*, and it is this last step of successful deduction from a hypothesis which serves to test the usefulness of the generalization. Thus science does not use induction *or* deduction, but both methods alternately. A theory derived inductively from the similarities of certain facts yields deductive conclusions which may be tested by new facts, so that the scope of scientific knowledge is expanded by both methods.

The Methodology of the Social Sciences.—The investigator in the field of the social sciences finds several points of difference from the physical sciences which first developed what now is called the scientific method. One distinction is to be found in the fact that the primary data of the social sciences are indefinitely more complex than those of the other sciences. No two individuals react in just the same way to economic stimuli, for example, since no two individuals have identical personalities. Thus it may be impossible to repeat exactly the results of a given experiment in economics because the conditions of the experiment cannot be duplicated perfectly.

Another distinction may be drawn between the physical sciences and the social sciences in that the former derive data chiefly from experimentation whereas the latter use the methods of exploration and sampling or enumeration. Since individuals cannot well be put in test tubes for experimentation, the social scientist is forced to attempt a choice of examples, from among the tremendously complex primary data, such that the variant under investigation will be as little affected by other forces as possible.

Cause and Effect.—The earliest stage of scientific investigation assumes the form of a search for the causes of occurrences. The analysis of a causal situation into its constituent factors may involve a physical separation of the factors, or it may involve isolation only in thought. This isolation is achieved by abstraction, a process which is distasteful to most laymen since they wish to discuss only the "real" world which they see on every hand. Those sciences in which physical analysis is possible are "experi-

mental" sciences in the narrower sense of the term. In any case the analysis of a causal situation is guided by two principles: first, nothing is a cause which is absent when the effect occurs; and second, nothing is the cause of a given effect which is present when the effect fails to occur. In so far as economic science is concerned, cause and effect should be regarded as related in time. Thus what came before was a cause if it always preceded an effect which appeared thereafter.

Tools of Economic Analysis.—Some of the tools whose logical use may permit us to analyze economic problems may next be considered. It is to be noted that each of these tools is merely an adaptation of tools used in other fields of scientific investigation. Thus static analysis is an attempt to secure some of the advantages of the laboratory method in which undesirable variables are eliminated during the experiment. Problems of measurement in essence are similar to those in surveying, in atomic physics, or in astronomy, with the distinction that the standard unit is not so satisfactorily defined in economics as in some other fields. The equilibrium analysis is a tool familiar to all students of chemistry or electrical engineering, while the marginal analysis is merely an application of the mathematical method of the differential calculus which has proved such a boon to investigators in many spheres of knowledge. The special form taken by these tools will be indicated briefly at this point; their actual application will be shown in the various chapters as the discussion progresses.

Static Analysis.—The large number of variables impinging upon many current economic problems renders careful analysis a difficult undertaking. In some sciences it is possible to isolate the variable to be studied, by controlled experiments in the laboratory or by other methods which reduce the number of separate factors which must be considered. This procedure frequently is not available to the economist. The tool which he uses to obtain a similar simplification for analysis is the assumption that all changes except the variation under discussion be ruled out. Hence he says "other things being equal." In other words, the economist assumes that all necessary adjustments have occurred to place the economic system in equilibrium. Thus no further changes are to be expected and we have the *static state* into which we now may introduce the variation whose effects we wish to

analyze. The danger inherent in this method is that conclusions reached from such static analysis may be carried over to the "dynamic" changing conditions of real life without adequate allowance for the fact that conditions really are changing and not constant. If this allowance is made, the method is a very helpful tool of analysis.

Prices the Chief Unit of Measurement.—The engineer uses such units as length, area, volume, density, temperature, and time in his calculations. Governments take great pains to define carefully the standard units which are the basis for engineering mensuration, and the engineer is alert to assure the proper use of these units in practice. Thus the surveyor allows for changes in the length of his chain which result from variations of temperature so that the unit of length in practice may remain synonymous with the standard unit at the standard temperature. Governments have not established a similar standard unit for use by economists. To some extent the engineer's units may be utilized, as when business activity is measured in terms of physical production, but economic problems primarily involve questions of *price*, so that the chief unit of measurement is value in terms of money. Even the engineer is forced to make use of this poorly standardized unit of measurement when he ventures into the field of costs in the attempt to determine whether a given development will pay for itself.

"Standard" Money.—The great number of measurements and decisions made in terms of prices and costs makes money a highly important unit for engineers and economists alike. This unit has been standardized by the government in a manner different from that used for the other standard units of measurement. This distinction may be seen most readily if we note some of the chief functions of money. Four of the functions of money are a means of payment, a measure of value, a store of value, and a unit of account. In other words, money is used to facilitate payments by the ready transfer of purchasing power from one person to another; the relative values of the multitude of commodities and services provided by our economic system are measured in terms of dollars; short-term savings may be held in the form of money or the promise to pay money so that the dollars represent an attempt to store value; and individual budgets, business records, and public finance all are handled by the

accountant in dollar units so that money is an almost universal unit of account.

In terms of these functions it is quite evident that our money unit should be so defined that its *generalized value* would be a constant at all times, just as the standard unit of length at Washington always bears a fixed relationship to such a constant as the wave length of sodium light, let us say. Therefore our money unit should have the property

$$\text{\$} = K \text{ (purchasing power)} \quad (2)$$

whereas actually it has the property

$$\text{\$} = K \text{ (weight of gold)}$$

so that the money unit is a unit of weight and not at all a unit of generalized value. This point will be elaborated in Chaps. VII and IX in the discussion of our money system, but it should be evident at this point that our "standard" money is not a standard of value measurement in the sense of the standard units of length or temperature. Although the dollar may represent a standard weight of gold, its value or purchasing power may fluctuate widely. Therefore the economist and, of course, the engineer must develop methods which will permit the compensation of value fluctuations as well as possible in order for price measurements to prove at all useful.

Index Numbers.—Index numbers are statistical devices which simplify the measurements of relative or absolute changes in the magnitude of one or many variables. Although their most common applications have been to historical series of commodity prices and wages, they have been used also to show changes in employment, production, and other economic series and in such personal factors as sales ability and related series. Three types of index numbers will be considered briefly: single series relatives, aggregate index numbers, and relative-from-aggregate indexes.

Single Series Relatives.—The value of United States exports for certain years is given in Table 1. How much greater were exports in 1929 than in 1926? To what extent did exports decline in the 5 years following 1929? Answers to such questions are simplified greatly if the export figures for each year are related to those for some one year as a base or standard. To say that exports in 1934 were only 26.5 percent of those in 1926 is more

readily understood than to say that exports declined \$3,536,200,000 by 1934. The latter method in itself tells nothing as to whether the decline was relatively great or small. The relative index number, on the other hand, has the distinct advantage that it permits ready analysis of the data in terms of *percentage* change.

TABLE 1.—VALUE OF UNITED STATES EXPORTS FOR SELECTED YEARS¹

Year	Exports	
	Value	Relative (base: 1926 = 100)
1926	\$4,808,700,000	100.0
1927	4,865,400,000	101.2
1928	5,128,400,000	106.6
1929	5,241,000,000	109.0
1930	3,843,200,000	79.9
1931	2,424,300,000	50.4
1932	1,611,000,000	33.5
1933	1,302,200,000	27.1
1934	1,272,500,000	26.5
1935	2,243,081,000	46.6
1936	2,416,477,000	50.2

¹ Commerce Yearbook, 1932; Statistical Abstract, 1937.

To convert the original data into a single series relative index number, it is only necessary to divide the figure for any period by that for the base year and to multiply the result by 100. Thus:

$$I_1 = \frac{P_1}{P_0} \times 100 \quad (3)$$

where I_1 = index number for given period.

P_1 = original series for given period.

P_0 = original series for base period.

The base period is the point from which we wish to measure the changes shown by the data of other periods. In selecting the base period, whether it be a week, month, or year, an effort is made to secure a "normal" period—one which is free from undue influences of any sort. Thus the last prewar year 1913 has been a common base, as is the predepression year 1926 now in more general use. Base periods less far removed from the immediate

present would be more satisfactory, because the most recent changes are the ones of greatest significance. Thus, in spite of the abnormality of the years after 1926, the United States Bureau of Labor Statistics has decided to use the average for 1935-1937 as a base, partly to bring the indexes up to date and partly to allow the inclusion of series not in existence in the predepression years.

Aggregate Index Numbers.—If several series are to be combined, in constructing an index number, the procedure will depend upon the original units. If they are dissimilar, relatives may be computed for each series. These relatives then may be averaged for each period. On the other hand, if the original units are comparable, aggregates may be used directly.

Simple aggregate index numbers are merely sums, for stated periods, of the prices or quantities of the articles concerned and are expressed in such units as dollars, tons, or kilowatt hours. Thus in Table 2 the simple aggregate index number for the base

TABLE 2.—SIMPLE AGGREGATE AND WEIGHTED AGGREGATE INDEX NUMBERS OF PRICES OF SELECTED COMMODITIES

Commodity	Quantity	Base period		Current period	
		Price	Value	Price	Value
Milk.....	500 qt.	\$ 0.10	\$ 50.00	\$ 0.12	\$ 60.00
Wheat.....	150 bu.	0.90	135.00	1.35	202.50
Coal.....	15 tons	4.50	67.50	4.00	60.00
Rubber.....	50 lb.	0.50	25.00	0.55	27.50
Steel.....	5 tons	18.00	90.00	21.00	105.00
Total price.....		\$ 24.00		\$ 27.02	
Total value.....			\$367.50		\$455.00
Converted to relatives.....		100.0	100.0	112.6	123.8

period is \$24, and for the current period \$27.02. That is, using the same notation as above,

$$I_0 = \Sigma P_0; \text{ and } I_1 = \Sigma P_1 \quad (4)$$

Weighted Aggregates.—The simple aggregates just discussed assign the same degree of importance to each of the five articles from which they have been computed. Actually, of course, such

commodities evidence a wide range of importance. The quantities of grease, oil, and gasoline consumed by an automobile in traveling a given distance at various speeds are quite dissimilar, as are the quantities of raw materials, supplies, and equipment utilized by several factories in producing a certain commodity or the relative amounts of food, clothing, and shelter consumed by different individuals in a given time. Due allowance therefore must be made for this situation if our index numbers are accurately to indicate changes in the original series. This process is called *weighting* and may be executed as follows: The data appearing in the column headed Quantity in Table 2 represent the amounts utilized and, when multiplied by the prices of the base period, give a total value of \$367.50. The same quantities multiplied by the prices in the current period give \$455 as the *weighted aggregate index number* of the current period, which is to be compared with the weighted figure secured for the base period. Letting Q_0 and Q_1 represent the weights for the base period and for the current period, respectively, if the weights are different,

$$I_0 = \Sigma P_0 Q_0; \text{ and } I_1 = \Sigma P_1 Q_1 \quad (5)$$

The choice of weights is the most important problem in the use of weighted index numbers. The quantities bought or sold in the base period generally are utilized as weights. Great care always must be taken in choosing the weights, since a change in weights obviously alters the index number which will be derived. Weighted indexes are to be preferred over the unweighted type for most purposes, since only the former are based upon a logical method of weighting.

Relative-from-aggregate Index Numbers.—Relatives may be compared more readily than the original data. The usefulness of aggregate index numbers can be enhanced, therefore, through the process of converting these indexes into relatives. The aggregates, either simple or weighted, are used as the original quantities that are to be related (see Prob. 21). Thus the *simple relative-from-aggregate* method applied to the data in Table 2 gives 112.6 as the index number for the current period, while the *weighted relative-from-aggregate* index number is 123.8 for the current period.

Deflation of Price Series.—Many series of economic data are expressed in monetary units, *i.e.*, in dollars, francs, marks, or

lire. These series are subject to continual distortion because of changes in the purchasing power of the money units of the various nations. Thus the value of building and engineering contracts awarded in the United States in December, 1914, was \$42,300,000; while in December, 1920, it was \$100,100,000. Does this mean that the volume of building construction was 150 percent greater in December, 1920, than in December, 1914? Not at all. The value of building contracts awarded in any year depends not only upon the actual volume of construction but also upon the prices of building materials, labor, and capital. The prices of these items underwent marked increases from 1914 to 1920. If we wish to measure the change in the volume of building alone, these values must be corrected for the increase in building costs between 1914 and 1920. Such a process is termed *deflation*, whether it results in a reduction or in an enlargement of the original figures.

The selection of an appropriate deflating index is the central problem in all such cases. We might use an index of retail prices, one of wholesale prices, or one of wage and material costs in the construction industry. Clearly, the last-mentioned deflator would be the best one, for it is more closely related to the problem under discussion.

Year and month	Original series (value of building contracts)	Deflator (American Telephone and Telegraph building cost index 1914 = 100)	Deflated series (deflated value of building contracts)
December, 1914.....	\$ 42,300,000	98	\$43,200,000
December, 1920.....	100,100,000	236	42,400,000

The procedure is to divide each value of the original series by the corresponding value of the deflator and to multiply the result by 100. This process, applied to the above example, shows that the volume of building construction in December, 1920, based upon 1914 prices, instead of being 150 percent greater than in December, 1914, was actually somewhat less. When, in succeeding pages, we have occasion to speak of *real income*, *real wages*, and so forth, we shall have in mind in each instance the deflated rather than the original values. The original values

will be referred to as *money income* or *money wages*. The distinction is a very important one for economics and should be kept constantly in mind (see Prob. 22).

Equilibrium Analysis.—Another tool of analysis frequently utilized by economists is the notion of an equilibrium in which the various forces which tend to produce changes neutralize each other so as to engender a stable adjustment. This tool is no stranger to the other fields of scientific investigation. The reversible reactions in chemistry, the damped electrical oscillations in a radio frequency circuit, the electron orbit theories of Bohr and others in atomic physics, and the economists' explanation of competitive price determination by the balancing of the forces of supply and demand are based alike upon the theory of an equilibrium adjustment in which further changes finally are eliminated, barring new disturbing factors, because of the neutralization of opposing forces.

Marginal Analysis.—A very important mathematical tool of analysis utilized in many fields of investigation is the differential calculus with which all engineers sooner or later become familiar. The economist refashions this tool somewhat and calls it the *marginal analysis*. Briefly, it consists of the addition or subtraction of small increments or doses of a variable whose behavior is to be studied. Thus the economist speaks of the "marginal product" when he is analyzing physical production in relation to input factors, of "marginal cost" when cost changes are studied in relation to output variations, of "marginal utility" when he studies the satisfactions rendered when goods are consumed, and of "marginal increments of supply and demand" in the analysis of prices. The marginal concept is of paramount importance in economic theory just as the differential calculus is of great benefit to investigators in other sciences.

Psychology of the Individual.—In the discussion of consumer reactions in Chap. XII we shall note the importance of the psychology of the individual consumer in relation to the demand for various commodities and services. In this connection economics draws upon its related science, psychology, for an explanation of the reactions of individuals in many of their economic activities. At this point we may emphasize the fact that economics is concerned primarily with only one aspect of human reaction, namely, those forms of behavior which are motivated

chiefly by economic forces. Men engage in various activities for a multiplicity of reasons, of which economic motivation is only one. For this reason some economists have assumed, as the basis for their analysis, a hypothetical individual called the "economic man." This individual is interested only in maximizing his income and minimizing his costs so that he reacts to economic stimuli alone and thus permits the economist to ignore non-economic factors. The use of the economic man as a tool of analysis may be of considerable assistance if care is taken to adjust predictions made on this basis to take account of the fact that no flesh-and-blood person acts in this way. The reactions of the economic man must be modified to bring them into line with reality. Thus a statement, for example, that persons adjust their expenditures so as to equalize the marginal utilities yielded by each type of commodity purchased must be interpreted in the light of the everyday experience that men are not purely rational consumers.

Collective Psychology.—Collective or crowd psychology, the meeting place of sociology, psychology, and economics, attempts to analyze human activities which are the outcome of group rather than of individual reactions. The customs of a people, the weight of public opinion, and the force of that phrase "keeping up with the Joneses" modify in no small way the individual reactions of the economic man and so must be considered in economic analysis. This tool, however, still in process of development by psychologists, has not yet been forged into a form suitable for wide application to economic problems, although it may prove to be helpful in the near future.

The Theory of Probability.—A distinction in regard to standards of measurement may be drawn between the so-called "exact sciences" and the "social sciences." This difference rests upon the *probability* with which a given event may be expected to occur in a given way. Indeed, the significance of economic laws, as well as of physical laws, is largely to be understood only through a knowledge of the theory of probability.

Probability may be defined as the ratio of the occurrence of a specified event to all the possible events that may occur in an infinite number of observations. This ratio may be based upon *a priori* knowledge of the conditions determining the probability, as in simple games of chance; or it may be based largely upon

induction, as is usual in the case of social phenomena. If an event may happen in a ways and fail in b ways, the probability of happening is $\frac{a}{a+b}$, and of failing is $\frac{b}{a+b}$. Unity is the mathematical symbol of *certainty*, while zero is the symbol of *impossibility*.

The simplest experiment is the tossing of a coin. If we toss one penny there are only two ways in which it may fall—heads or tails. Therefore the probability of heads is one-half and tails one-half, or 1 out of 2 in either case. If two coins are tossed, both may come heads, both tails, or either one a head and the other a tail. Thus the probability of securing two heads in one toss is 1 out of 4.

If an event may happen in any *one* of many different independent ways, the probability of its happening is equal to the sum of the separate probabilities, or $\frac{a}{a+b} + \frac{a'}{a'+b'}$. The probability of drawing either a club or a heart from a deck of completely shuffled cards is $\frac{13}{52} + \frac{13}{52} = \frac{26}{52}$, or 1 out of 2.

The probability of the occurrence of a particular *compound event*, in accordance with chance, is equal to the product of the probabilities of the happening of the separate independent events,

or $\frac{a}{a+b} \times \frac{a'}{a'+b'}$. If two separate packs are used, one card being drawn from each pack, the probability of drawing two kings is $\frac{4}{52} \times \frac{4}{52} = \frac{16}{2,704}$ or 1 out of 169.

Practical Applications of Probability.—The use of probability analysis may be indicated by a few practical illustrations. A simple case involves the so-called “policy” or “numbers racket” in which an individual selects a number between zero and 999. Upon the purchase of a policy slip for 1 cent, the number writer agrees to pay \$5 to the individual if his number happens to be the one published, say, in the thousands columns of the stock-market reports of shares sold for the day. The probability of selecting the winning number is 1 out of 1,000 while the payment for a successful selection is 500 to 1. Thus the individual who plays the “numbers racket” is on the short end of 2-to-1 odds even if the “racket” is an honest one which always will pay on a winning number which is not “fixed.”

Another illustration involves the measurement by ten persons independently of the length of a room. Suppose the results are as shown in Table 3.

TABLE 3.—LENGTH OF A ROOM TO THE NEAREST ONE-HUNDREDTH OF AN INCH AS MEASURED BY TEN PERSONS

Person	Length		
	Feet	Inches	
A	20		9.38
B	20		9.38
C	20		9.44
D	20		9.44
E	20		9.50
F	20		9.50
G	20		9.56
H	20		9.63
I	20		9.75
J	20		10.00

The mean (average) length is 20 feet 9.56 inches and the middle 50 percent of the lengths fall within the range 20 feet 9.44–9.63 inches. Now suppose the length of the room is measured again, either by the same persons or by others, with the same measuring instruments. The probability is 1 out of 2 that the new lengths obtained will fall within the middle 50 percent range 20 feet 9.44–9.63 inches. This use of probability is highly significant for the economist. Just as it is impossible for the engineer to obtain the *exact* length of a room without errors of any kind, the economist often is unable to obtain exact data respecting supply and demand conditions, let us say. He may compute a demand function which is the best possible statistical measure of demand for a given product, but variations from this measure are sure to occur. Thus the demand and supply diagrams presented in Chap. XIII, for example, utilize an area superimposed upon such a demand function so that the probability is 1 out of 2 that any given case actually will fall within the limits of the area, since it may be very unlikely that a given case will fall exactly upon the line which represents the function itself.

Probability vs. Certainty.—Probability is any degree of rational belief lower than certainty. Certainty, on the other hand, may be regarded as a special case of probability; it may be considered, in fact, as the *maximum probability*. In either instance,

probability comprises that part of logic which deals with arguments that are rational but not conclusive. This statement, however, must not be taken to mean that probability is a form of uncertainty. Nothing could be further from the truth. Indeed, knowledge regarding the probability with which some events may be expected to occur is more certain than most forms of information possessed by man.

Some things never happen either in the physical or in the economic world because they are *impossible*; others because they are *too improbable*. The laws which forbid the first type of reaction are called primary; the others secondary. Most persons—and this group includes many eminent scientists as well as most laymen—feel that scientific laws should be primary in nature. However, primary law does not answer all the questions which we may reasonably wish to posit. Primary law says a pan of water placed on a fire may boil or freeze; the given information is inadequate for a definite answer. Secondary law says the probability is overwhelmingly in favor of boiling: it is too unlikely that heat will pass from the water to the fire, although that event is remotely possible. Thus many laws of all sciences really are based upon probability.

The laws of the “exact sciences” enjoy a higher degree of probability, and the events group themselves more closely about the average, than do those of the “social sciences.” This difference is due only in part to the inability of the social scientist to use laboratory methods at all times. The difference also is due in considerable measure to the fact that the social sciences are *social*, *i.e.*, they are forced to deal with groups of individuals, and so must use the methods of statistics, which are based upon probability rather than upon certainty (see Prob. 23). Their findings are not less scientific, however, because of this fact; they are merely to be interpreted as applying to the majority of events rather than to every event concerned.

The Normal Frequency Curve.—The various probable values of an occurrence tend to be symmetrically arranged according to the law of chance distribution. Chance means the result of a multiplicity of causes no one of which is dominant. A chance arrangement of values, called a normal frequency or “bell-shaped” distribution, is shown in Fig. 2, together with the values actually obtained when 10 coins were tossed 1,024 times, the number of

heads in each throw being counted. The actual distribution was not quite "normal," perhaps because the number of tosses was too small to provide an adequate sample, or perhaps because the coins were not absolutely "true."

Continuous and Discrete Series.—Two types of variables may be found in economics, as in other sciences. In a *continuous series* infinitely small variations may occur, while in a *discrete series* the variations cannot be smaller than some minimum value. The horsepower developed by a gas engine may be represented by any

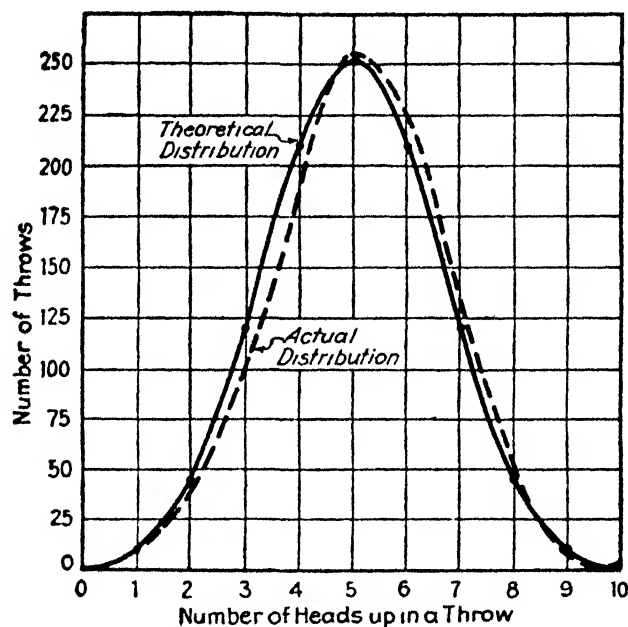


FIG. 2.—Frequency distribution. Actual and theoretical results from tossing 10 coins 1,024 times.¹

value between zero and fifty, let us say. Variations in output within this range may be infinitely small, although their measurement is limited in practice by the sensitivity of our measuring devices. In the last analysis, few economic series are of this type.

The number of cylinders possessed by the motor, however, can vary only by whole numbers. This series is thus discrete, as are the data in Fig. 2. Examples of discrete economic series may be found in price quotations and in production figures. Data of this type are represented more accurately by a histogram, a series of vertical rectangles, than by a smoothed curve of the type shown above, although the curve form commonly is used for the sake of convenience. The student should remember, however, that in

¹ JEROME, H., "Statistical Method," Harper & Brothers, 1924, p. 169.

reality the data are discrete although the variations may occur in very small increments.

Averages.—A frequency distribution may be *described* briefly by the selection of a single value which is representative of the distribution as a whole. The most frequently used descriptive values are *averages*, the more common types of which are:

M , the arithmetic mean.

Md , the median.

Mo , the mode.

The arithmetic mean employs the method of computation which most people have in mind when the term *average* is used, namely, the sum of the items divided by the number of items. For the actual distribution of Fig. 2, $M = 5.135$ heads per throw, while for the normal frequency distribution $M = 5$ heads per throw. It is to be noted that the value of M is affected by every item in the series. The mean is easily calculated, but it may be meaningless when, as in this case, the original values compose a discrete series and this method of computation yields a fractional answer.

The median is the *central* item, in point of position, in a series which has been arranged in order of magnitude. The exact median value for Fig. 2 is secured by interpolation by proportional parts in the median class. $Md = 5.154$ heads per throw for the experiment, and $Md = 5$ for the theoretical distribution. The magnitude of this measure is not affected by extreme deviations, but it also may be meaningless for a discrete series composed of an even number of items. The median may be located when the data are incomplete, or not capable of quantitative measurement, if the relative positions of the items are known.

The mode, the *most common* item, is the value on the base scale corresponding to the maximum ordinate of a given frequency curve. For the experimental series of Fig. 2, $Mo = 5.202$ on the basis of interpolation, while $Mo = 5$ for the theoretical series. For many persons, "average" really means "mode" or the item which occurs most frequently. The mode is not affected by the magnitude of extreme deviations, but it is hard to locate accurately and it has little significance unless the series possesses a distinct central tendency.

The Use of Statistics in General.—The proper use of statistical methods rests upon two fundamental conditions. On the one hand, the “facts” used must be reliable; and on the other hand, their relationships must be such as to warrant the drawing of conclusions from them. There are many tests of statistical evidence, but space will permit us to mention only a few.

Do the Data Measure the Thing about Which We Desire Knowledge?—In a general depression a manufacturer of automobile parts may be able to report large sales, whereas automobile producers may give a diametrically opposite report; employees of public utilities may be at work while machine tenders are walking the streets. It is thus evident that many different kinds of data usually are necessary if we are to attempt adequate measurement of business and economic conditions.

Are the Data Comparable?—Much discussion frequently takes place concerning changes in wages, profits, volume of sales, and many other matters, when the fundamental change involved is really that of the purchasing power of the money unit. The various series are not comparable until they have been deflated and otherwise prepared for analysis.

Are the Data Adequate?—One cannot gauge a city’s consumption of gas by measuring the quantity taken in a single hour, nor can the volume of business of oil refineries be determined by the business done in the month of February alone. Obvious as these mistakes appear, they are made constantly, and so one should guard carefully against repeating them.

Have the Data Been Secured by a “Complete Count” or Are They Merely a “Sample” of the Whole?—In many cases it is impracticable or impossible to secure a complete count of all the items involved, whereupon the sampling process may be used instead. It is here that a distinction may be drawn between the methods of statistics and those of accounting. A primary aim of the accountant is to assign every dollar of income or outgo to its proper place, while the statistician endeavors to carry the formation of significant judgments *beyond* the limit where a complete count is possible. Insurance rates, cost-of-living studies, market analyses, many index numbers, and numerous other series are based entirely or in large part on the sampling process.

Has the Sample Been Properly Selected?—If the conclusions drawn from analysis of a sample are to be applicable to the

whole, the sample must truly represent the entire group of items. Thus every item in the total must have the same chance of inclusion in the sample. Here we must be careful to distinguish *random* (chance) selection of cases from careless or biased selection, since the latter may lead to serious error with or without the investigator's knowledge. To be representative, a sample not only must be based on random selection or its equivalent, but also must be adequate in size, since this factor affects the reliability of the measures computed from the sample.

Speaking in general terms, the economist often resorts to such phrases as "the tendency is," "other things being equal," "that depends," and so on. It should be remembered, however, that comments of this sort are not limited to the economist. Suppose an electrical engineer were asked what would happen to a person touching a wire carrying a charge of electric current. He could not make one all-inclusive and -exclusive answer without the possession of additional facts.

Finally we must not overlook the statistical interpretation of "cause and effect." In economics to say that one event causes another is merely to say that the former event precedes the latter in point of time. Cause and effect must be considered merely as a time sequence. Thus today's price of rubber depends upon yesterday's price, plus certain modifying factors that have appeared since yesterday's price was determined. Tomorrow's price will depend not only upon today's price but upon additional modifying factors that appear between today and tomorrow. It is only in this sense that we may speak of the "cause" of a given price. Hence adequate statistics do not guarantee unimpeachable analysis, for it is the logical use of the facts made available by proper statistical treatment which is the most significant factor in the validity of the results thereby achieved.

Summary.—Part I has pointed out the current and personal nature of economic problems. The problems are those with which the nation is concerned today. They are topics intimately connected with the news in the daily press and they affect the lives of engineers as well as those of other citizens. It is impossible to escape these problems. If citizens and political leaders alike take no action regarding them certain effects will result nevertheless; other effects might be obtained if action were taken, but effects of some sort will appear in any case.

A few basic concepts of economics have been defined and the student has been warned of the need for careful use of definitions in order to secure clear thought and to avoid misunderstanding. Methods of analysis have been examined and economic science has been related to the other sciences in respect to aims and methods. Upon the basis of this introduction to the subject we shall turn in Part II to an examination of the business system of today, of its history, modern development, and operation. An understanding of the conduct of modern business will prepare us for the analysis of cause and effect—in short, for the treatment of economic theory—which will follow the description of our industrial society to which we now turn.

Problems

19. “Doing nothing in respect to economic matters is in itself an economic policy.” Explain. To what degree would the same hold true in engineering technique?

20. A person with a small amount of money to invest is considering buying shares of stock in a copper company. He finally purchases the stock because the price of copper advanced from 11 cents to 13 cents a pound. What additional information is needed before the advisability of the purchase can be determined?

21. a. On the basis of the following four materials, compare building costs in 1938 with those in 1928 by computing simple relative-from-aggregate index numbers with 1928 as the base:

Commodity	Quantity	1928	1938
Building brick.....	1,000	\$45	\$40
Cement blocks.....	1,000	75	60
Lumber, board feet.....	1,000	65	60
Roofing, square feet....	1,000	20	17

b. If a weighted relative-from-aggregate index is used instead, will the results be different from those obtained in *a*? Why?

22. On the basis of this index of wholesale prices, compute the deflated index of United States exports given in Table 1 on p. 42.

WHOLESALE PRICE INDEX			
1926	100.0	1932	64.8
1927	95.4	1933	65.9
1928	96.7	1934	74.9
1929	95.3	1935	80.0
1930	86.4	1936	80.8
1931	73.0	1937	86.3

23. The American Experience Table of Mortality indicates the following data for life expectancy at certain ages:

Age	Rate of mortality per 1,000	Probable future life- time, years	Expectation of life, years
10	7.490	63.5	48.7
20	7.805	53.5	42.2
30	8.427	43.5	35.3
40	9.794	33.5	28.2
50	13.781	23.5	20.9
60	26.693	13.5	14.1
70	61.993	.5	8.5
80	144.466	.5	4.4
90	454.545	....	1.4

What kind of average is meant by "probable future lifetime"? By "expectation of life"? What is the most probable age attained at death? What meaning would you ascribed to "probable" in this connection? Use the mortality rates as given to compute the probability of death of an individual member of the college community at various present ages.

24. Determine the basis upon which the *New York Times* weekly index of business activity is computed; the Bureau of Labor Statistics cost-of-living index. How do the current figures for these indexes compare with those for last month, and a year ago?

25. "There are really no such things as economic laws because these so-called 'laws' always have exceptions." Discuss in terms of probability.

References

BEARD, C. A.: "The Nature of the Social Sciences," John Wiley & Sons, Inc., 1934.

BURGESS, R. W.: "The Mathematics of Statistics," Houghton Mifflin Company, 1927.

CHADDOCK, R. E.: "Principles and Methods of Statistics," Houghton Mifflin Company, 1938.

COMMONS, J. R.: "Institutional Economics," The Macmillan Company, 1934.

CROXTON, F. E., and D. J. COWDEN: "Practical Business Statistics," McGraw-Hill Book Company, Inc., 1935.

FRY, T. C.: "Probability and Its Engineering Uses," D. Van Nostrand Company, Inc., 1927.

MILLS, F. C.: "Statistical Methods Applied to Economics and Business," rev. ed., Henry Holt & Company, 1938.

MONTGOMERY, R. H.: "Financial Handbook," Ronald Press Company, 1933.

The economist makes use of a long list of government reports and bulletins, the services of various private statistical agencies, and economic and business periodicals and journals. The following list is intended to be suggestive rather than a summary of the literature.

Government

"Statistical Abstract of the United States" (annual), Bureau of Foreign and Domestic Commerce. (Beginning with 1938, the Bureau of the Census.)

Survey of Current Business (monthly and weekly supplements), Bureau of Foreign and Domestic Commerce.

"Census of the United States" (decennial), Bureau of the Census.

"Census of Manufacturers" (biennial), Bureau of the Census.

"Census of Distribution" (1929, 1933, 1935), Bureau of the Census.

Federal Reserve Bulletin (monthly), Federal Reserve Board of Governors.

Monthly Labor Review, United States Bureau of Labor Statistics.

Private

The American Economic Review (quarterly), The American Economic Association.

The Annalist (weekly), The New York Times Company.

Automobile Topics (weekly), Motor Trades Publishing Company.

Brookmire Forecaster (monthly), Brookmire Bulletins, Inc.

Commercial and Financial Chronicle (weekly), William B. Dana Company.

Conference Board Bulletin (weekly), National Industrial Conference Board.

Dodge Statistical Research Service (monthly and trimonthly), F. W. Dodge Corporation.

Index of Machine Tool Orders (monthly), National Machine Tool Builders Association.

National City Bank Bulletin (monthly), National City Bank (New York).

New York Stock Exchange Bulletin (monthly), New York Stock Exchange.

Retail Price Index (monthly), Fairchild Publications.

Review of Economic Statistics (quarterly), American Statistical Association.

Standard Statistics Services (Standard Market Rating—monthly; The Business Forecast—weekly; Basic Statistics—Wednesday and Friday), Standard Statistics Company.

Steel (magazine), Penton Publishing Company.

PART II
THE BUSINESS SYSTEM

CHAPTER IV

THE EVOLUTION OF MODERN INDUSTRY

The complexities of the present economic system are to be understood only in terms of a gradual evolution from more simple forms. The technical developments of industry, the forms of business organization, the legal framework in which business operates, the financial system, and the human relationships of employee and employer, for instance, are descendants of a past, either recent or remote. It is the purpose of this chapter to indicate something of this background and of the evolution which has brought about the business world as we know it today. Since some of these changes will be discussed elsewhere, attention here will be confined largely to the technical and legal developments.

I. TECHNICAL BACKGROUND

. . . Let us imagine the whole history of mankind crowded into twelve hours, and that we are living at noon of the long human day. Let us, in the interest of moderation and convenient reckoning, assume that man has been upright and engaged in seeking out inventions for only two hundred and forty thousand years, which is probably less than one-fourth of the actual time man has been on the planet. Each hour on our clock will then represent twenty thousand years, each minute three hundred and thirty-three and a third years. For over eleven and a half hours nothing was recorded. We know of no persons or events; we only infer that man was living on the earth, for we find his stone tools, bits of his pottery, and some of his pictures of mammoths and bison. Not until twenty minutes before twelve do the earliest vestiges of Egyptian and Babylonian civilization begin to appear. The Greek literature, philosophy, and science of which we have been accustomed to speak as "ancient," are not seven minutes old. At one minute before twelve Francis Bacon wrote his *Advancement of Learning*, and not a half-minute has elapsed since man first began to make the steam engine do his work for him.¹

¹ JAMES HARVEY ROBINSON, "The Human Comedy," Harper & Brothers, 1937, pp. 86-87.

The extreme youth of the industrial system, when compared with man's stay on this planet, is remarkable. The period during which the human race has been present on the scene is immeasurably long compared to that portion of it in which industrial advances have been made. About half of the span of human existence on the earth was passed without the use of any tools except those of the most rudimentary nature. Crude stone implements alone were used during some hundreds of centuries, after which came in increasingly rapid succession the Bronze

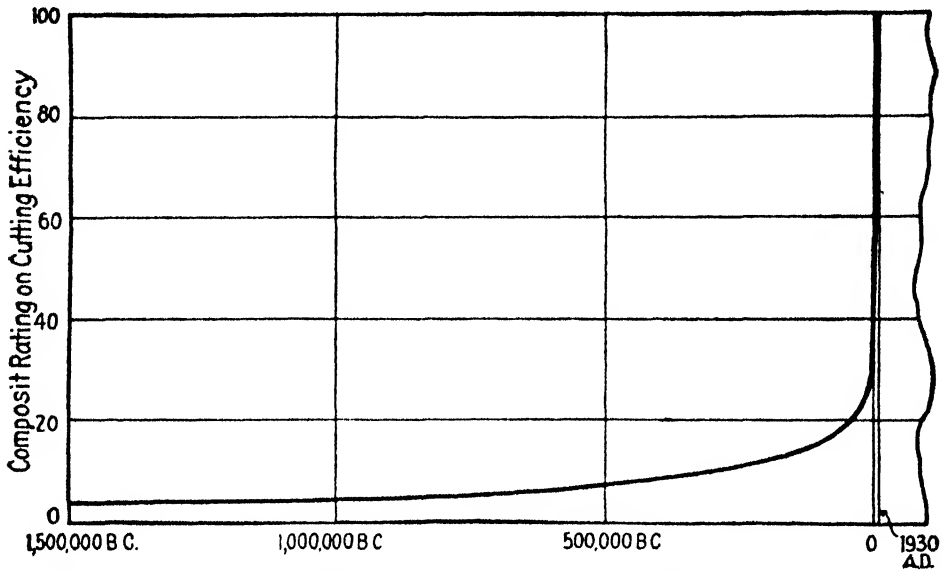


FIG. 3.—One and one-half million years of cutting efficiency of tools.¹

Age, the Iron Age, the ages of Steel, of Steam, and of Electricity. The Industrial System did not make its appearance until yesterday, relatively speaking. It is a contemporary of Steel and of Steam. Thus modern industry is very much of a newcomer in man's environment.

Significance of Man's Prehistoric Economy.—Man today brings to the art of production two major types of equipment: his equipment of intellectual capacities and emotions and his equipment of technical knowledge. It is very significant that much of his mental equipment was completed in the days of primitive man; and that the basic elements of his technical equipment for production, the wheel, the lever, and the inclined plane, also were discovered and perfected in a relatively early

¹ FAIRCHILD, M., and H. HART, *A Million Years of Evolution in Tools*, *The Scientific Monthly*, Vol. 28, January, 1929, p. 78.

period. Knowledge and training have increased markedly in the last 10,000 or 20,000 years but, according to able authorities, little corresponding increase in brain power or innate mental ability has appeared. Indeed, Cro-Magnon Man, who lived in Europe about 25,000 years ago, had an average brain-case capacity 16 percent greater than the modern average. The feelings and impulses of the modern factory worker probably are fundamentally similar to those of the primitive toiler using implements of stone.¹ The mental equipment which was completed in the primitive environment of our ancestors is now plunged into the humdrum environment of the factory and the mill. The maladjustment between mental equipment and the rigorous discipline of the factory is manifested in monotony, fatigue, unrest, bitterness, and sabotage. One problem today is how to conduct the Machine Age with a mental equipment which developed largely to fit Stone Age conditions.

Historical Economies.—Man's slow advance from complete dependence upon his native environment to a large degree of control over that environment often is divided into a series of stages or *economies*. First historically was the *economy of direct appropriation*, in which man lived directly upon those gifts of nature which he was fortunate enough to find from day to day.

In the *hunting economy* which followed, private personal property first appeared in the form of tools, weapons, and ornaments. Hunting grounds still were free to all or were owned in common by the tribe. Since tools and weapons allowed man to sustain life more easily, leisure was available in which new methods could be discovered and old ones improved. In the *pastoral economy* the bounds of private property were expanded to include ownership of herds and flocks, though grazing land often was free since man was nomadic and moved about in search of new pastures. Here for the first time man utilized "natural" processes to lay up a stock of supplies for the "rainy day."

Generally speaking, the domestication of plants was preceded by that of animals; to cultivate plants man must maintain a relatively fixed abode. The *agricultural economy* thus instilled in man a new outlook on life, for the stockman was of a roving disposition quite foreign to that of the farmer. Private property

¹ See the presidential address by Dr. H. S. Harrison before the British Association for the Advancement of Science, Sept. 4, 1930.

now included tools, land, buildings, and even water rights. During the rise of agriculture land was plentiful and machinery was unknown, hence the major expense to the landowner was that of labor. Thus the importance of *slavery* was greatly enhanced, and the business of slave trading underwent marked expansion.

In the pastoral and agricultural economies men were largely self-sufficient, for there was very little trade and a man's own activities served to satisfy his meager wants. As the state of the arts advanced, however, this situation underwent a gradual change. With a more dense population, men came to specialize in particular tasks. Thus the blacksmith and the miller relieved the farmer of certain of his duties and allowed him to concentrate his efforts upon farming itself. This specialized production of articles for sale by individuals or small groups who worked by hand in the home or shop characterized the *handicraft economy*. Here machinery was not used, and employment, production, and sale occurred only on a small scale and so were personal rather than impersonal activities.

The *industrial economy* in which we live today was the final outgrowth of the handicraft system. It is characterized by large-scale machine production in factories; by the impersonal labor relations of wage earners employed by "capitalists" and the impersonal sales relations of producers and consumers who never see each other; and by the price and cost problems of quantity production. It is the outgrowth of some five business "revolutions;" rapid, far-reaching changes in agriculture, trade, finance, employment, and mechanical technique.

The "Industrial" Revolutions.—Marked changes in *commerce* occurred near the close of the fifteenth century, partly as a result of changes in the standard of living of the upper classes following the crusades, and partly as an outgrowth of the maritime inventions and discoveries of the period. The centers of trade were transferred from the Mediterranean to Holland and to England. Markets for foreign goods were enlarged, foreign trade routes were established, and the next four centuries witnessed an extension of the commercial relations of mankind to which there is no parallel in history.

The rise of modern *banking* and *finance* dates from the late sixteenth century. Stable currencies and strong central govern-

ments encouraged the use of credit and the payment of debts by means of bills of exchange. The growing freedom of the common man was closely related to the displacement of payments "in kind" by payments in money. Recognition of the bank note as a representative of credit rather than as a mere warehouse receipt for coin appeared at the close of the seventeenth century, and some decades thereafter the second characteristic feature of modern banking—the granting of deposit accounts upon the mere credit of borrowers—was evolved.

Agriculture underwent marked changes about the middle of the eighteenth century, although many of these developments were in evidence as early as the sixteenth century. The rotation of crops, the use of improved strains of seed and of stock, the specialization of given areas upon particular farm products, and the introduction of improved methods and machinery have changed the whole nature of the industry. The productivity of the farm has been increased enormously, and the self-sufficient nature of farm life has been deeply undermined.

Early in the eighteenth century the conditions of *employment* were vitally altered. Throughout the whole course of history up to that time, industry in general had been in the hands of masters and small craftsmen, who commonly worked in their own houses. They frequently were members of *craft guilds*, were mostly their own employers, and formed an essential and permanent middle class. There were a few capitalists, but there were no big capitalists. There were no rich manufacturers then. The rich men of that time were great landowners or money-lenders; but in the eighteenth century workers in certain industries were collected together into factories in order to produce goods in larger quantities through a systematic division of labor. Thus the employer, as distinguished from the master workman, began to be a person of importance. Production was still largely by hand labor instead of by power machine, but specialization by tasks was greatly developed.

The *mechanical* revolution of the late eighteenth and early nineteenth centuries, arising as it did from the development of organized science, was an entirely new thing in human experience. The steam railway, the steamship, and the electric telegraph were to the popular imagination of the nineteenth century the most striking and revolutionary of inventions. They were, however,

only the most conspicuous first fruits of a far more extensive process. Technical knowledge and skill were developing with an extraordinary rapidity and to an extraordinary extent, when measured by the progress of any previous age. A gigantic new material framework for human affairs has come into existence because of the resultant increases in productivity. Great readjustments of our social, economic, and political methods to meet these changes are clearly demanded, yet these readjustments are only in their opening stages today.

The Industrial Revolution as a Whole.—The five great changes we have just outlined interacted upon each other. A change in one field hastened developments in another so that the economic life of the whole world surged forward with a rush. The industrial system as we know it today is not only the direct outgrowth of these upheavals but also contains within itself the seeds of further revolution. The changes are still occurring. We are living in the midst of the industrial revolution, and it may well be that the developments of the future will prove to be more striking and more far-reaching than were those of the past.

The effect of these changes upon industrial relations has been noteworthy. The manufacturer and craftsman had been traditionally a middle-class townsman. The factory and the employer now displaced him. Either he became an employer of his fellows and so grew toward wealth and equality with the other wealthy classes, or he remained a worker and sank very rapidly to the level of a mere employee.

As these developments spread throughout the world during the nineteenth century, a great gulf opened for the first time between the employer and the laborer. Every manufacturing worker in the past had at least the hope of becoming an independent master craftsman, but now a factory became a vast and costly enterprise when measured by the scale of a workman's income. He might still become a farmer if he could find unoccupied land, but even that door was closed near the end of the nineteenth century and the typical artisan was thenceforth doomed to be a worker from the cradle to the grave. Thus great, ugly factories grew up, built as cheaply as could be to hold as many workers as possible, while around them huddled the streets of workers' homes, built at the cheapest rate, without sanitary facilities,

without privacy, often without decency, and let at the utmost rent that could be exacted.

Many people are too much inclined to think of the Industrial Revolution as leading only to the enslavement and overworking of men, women, and particularly children who hitherto had been happy and free. This belief, however, misinterprets history, for it confines attention to only one side of the picture. From the very beginnings of civilization the children of the poor, for example, had always been obliged to do whatever work they could find to do. In reality, the factory system gathered up all this infantile toil and made it systematic, conspicuous, and scandalous. As a result, in 1819 the first British Factory Act was passed. Some of the provisions of this first attempt to restrain employers from taking the most stupid and intolerable advantages of their workers' poverty amaze us today. It seems incredible now that it should ever have been necessary to protect little children of *nine* from work in factories or to limit the normal working day of such employees to 12 *hours*. With the passage of this act, however, the protection of the children of the poor, first from toil and then from bodily starvation and from ignorance, was begun. Unfortunately, this work has not yet been completed even in the more "civilized" portions of the world.

Economic Policies of the Period.—Two policies in effect at the time of the Industrial Revolution, in regard to the control of the economic system, should be mentioned before we take up our discussion of modern industry. One of these is known as *mercantilism*. The policy of government *regulation* of economic activity, the mercantilistic policy (not to be confused with government *ownership* or socialism), was in force during the sixteenth and seventeenth centuries. Since the mercantilists wished to build up both the commercial and the military power of their nation, regulation was quite extensive. Manufacturing processes were specified in great detail; prices and wages were subject to strict examination; and foreign trade was carefully controlled. The purpose of regulation was to build up at home a stock of the precious metals through the so-called "favorable balance" of trade, *i.e.*, more exports than imports. England was the leading mercantilistic nation. Her Navigation Acts

attempting to control the balance of trade were so obnoxious to the American colonies as to be partly responsible for the American Revolution.

Partly owing to the new opportunities for profit emerging out of the Industrial Revolution and partly because individuals were merely restive under such severe government restrictions, a philosophy opposite to that of mercantilism, called *laissez faire*, was later developed. This policy was particularly strong in France, hence the name, meaning "hands off," which refers to governmental non-interference with business. Adam Smith, a Scotsman who is generally credited with having established the science of economics, became one of the leading exponents of this philosophy. He argued for the completely automatic operation of the economic system, as opposed to the non-automatic system of mercantilism. In his famous book, "The Wealth of Nations," published in 1776, he said that if individuals were allowed to have complete economic freedom, each would seek to serve his own economic interests and in doing so would at the same time more largely serve the interests of his fellows. In practice, however, the *laissez faire* policy of complete economic freedom was unsuccessful. For example, adulteration and misrepresentation of goods and virtual enslavement of employees resulted. Thus it was necessary to give up the notion of complete freedom and to revert to a certain degree of governmental control.

Recent Industrial Developments.—Present-day developments in the United States represent the latest phase of cumulative processes that have dominated Western life since the industrial and mechanical revolutions began. One of these processes involves the marked growth of population that has occurred in the last 80 years. Thus the nineteenth century brought an unprecedented increase in the number of Europeans; a remarkable spread of Europeans over the earth; and marked improvements in their standards of material comfort. In 1850 the population of European origin was about 316 million and of non-European origin about 777 million, while in 1925 the number in the former group had reached 639 million as compared with 1,107 million for the latter.

Another development of the industrial and mechanical revolutions that is of major significance involves industrial applica-

tions of chemistry and electricity, the increasing precision of work, the system of interchangeable parts, the progress toward automatic mechanisms, and the linking of machines into continuous processes for mass production, which are typical of the new technique of material progress. Science spread from its ancient stronghold of mathematics into a systematic study of the most varied phenomena, from physics to psychology, from biology to the production, transportation, and distribution of goods.

The Rise of the Engineering Professions.—The industrial application of scientific discoveries was secured by the rise and differentiation of the engineering professions. From the parent stock of military engineers there have been developed in turn civil, architectural, mechanical, mining, marine, sanitary, gas, chemical, electrical, efficiency, agricultural, and production engineers. Each group has been trained in the fundamental sciences and has gained wide experience in industrial practice. It is in no small measure as a result of their efforts that the developments of science have been consolidated and set to work at raising the standards of material comfort of people the world over.

As part of this development, vast new granaries appeared in the Mississippi Valley, Argentina, and Canada; vast new ranges for cattle and sheep stretched from Texas to Montana and over much of Argentina and Australia. The textile mills of England were fed cotton from the United States, Egypt, and India; silk from China and Japan; wool from the great ranges; and coarser fibers from Mexico and the Philippines. European soils were replenished from the nitrate deposits of Chile. Iron ranges of great extent were found in North America; copper was discovered in the United States, Chile, and Peru; gold flowed from Brazil, California, Alaska, Australia, and South Africa; and petroleum pools were discovered in many parts of the world.

To develop these new resources, engineers were needed everywhere. They had to dig mines and to build machines, factories, railways, roads, and warehouses. Every discovery put to use on a commercial scale meant a new equipment job, which often was very extensive. But while the engineers were doing all this work on the means of production, there appeared simultaneously an ever larger flow of the things men eat and wear and with which

they house and amuse themselves. This net gain in ability to provide for their desires has brought men everywhere an opportunity to increase their numbers, to raise their standards of consumption, to reduce their hours of work, and to give their children more education. The engineering professions may well be proud of such far-reaching results.

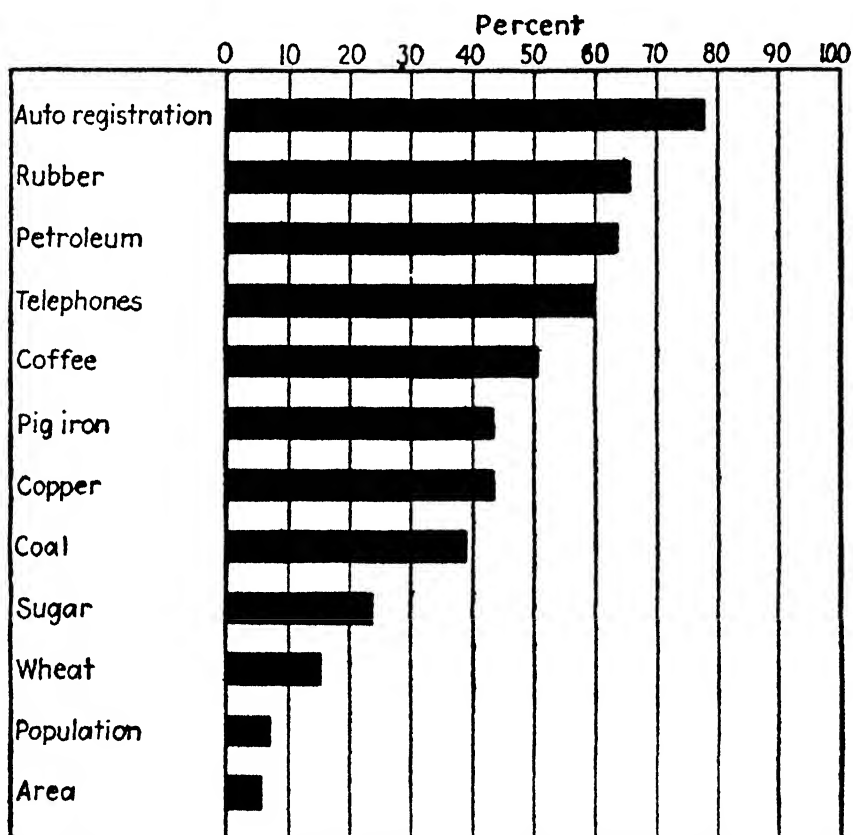


FIG. 4.—Percentage of world's production of selected commodities consumed by the United States; population and area of the United States expressed as a percentage of world's population and area.¹

Industrial Position of the United States.—The relative position of the United States in the world economy is strikingly shown by Fig. 4. The last two bars, showing area and population, indicate the proportion of the world's goods this country might be expected to enjoy if it were merely in an average position. The remaining bars indicate the portion of selected commodities actually consumed. Though they represent only a very few items, they show the preferred position held by the United States.

¹ Data obtained from the "Statistical Abstract of the United States" (1937) and the "Agricultural Yearbook" (1936). Data are not for identical years.

We may say, then, that the greatest development of the Industrial Revolution is the system we see about us. The system has grown to its present status, however, not only because of the technical developments of the last century and a half but also because of the legal developments of a somewhat longer period. To understand the modern industrial system, we must note the outstanding elements of its legal background.

II. LEGAL BACKGROUND

The basis of modern capitalism is property and contract. The rights of individuals and corporations, and their obligations in terms of contracts, determine the ways in which our economic system functions. The legal foundations of capitalism must be understood if we are to appreciate the conditions which permit or limit industrial action today.

Rights.—A *right* is a claim of one free person upon another, and involves an *obligation* or *duty* on the part of the other person or persons. Thus one of the rights of private property involves the power to exclude others from possessing the property, and it involves the obligation of others to respect this power by refraining from trespassing on the property. The idea of a "right," for most persons, involves an ethical relation: the problem of good or bad, of virtuous or vicious, of right or wrong. Economics here impinges upon ethics and, in order to settle disputed questions of right, is related also to jurisprudence. Hence business is conducted according to the working rules of property and contract developed principally through the formulation of the common law by the courts. Without such rules, modern business would be impossible.

Contract.—A legally enforceable agreement between two or more persons to do or not to do a particular thing is a contract. The two main types of contracts are *contracts under seal*, such as bonds, and *simple contracts*, which may be written but without seals, or which may be oral. The oral contract may be express or implied in fact. That is to say, it may be a definite statement; or it may be deduced from circumstantial evidence which shows an intent to contract, a common example of which is the sale of personal property for cash. A very significant form of contract is the *negotiable instrument*. It is a form which may be trans-

ferred by assignment, indorsement, or delivery. A third party who legally receives such an instrument may obtain a stronger title than that possessed by the original creditor, for if he is a bona fide purchaser for value he takes it free from defect in title and free from equities against the original creditor.

Property.—From the legal viewpoint, the significant aspects of wealth are the *property rights* which give the *uses* or *enjoyments* of that property to the owner. The benefits or enjoyments that flow from it are his to do with as he desires. A curtailment of the use by an agency of the government is therefore a deprivation of property and is forbidden by the Constitution unless reasonable recompense is made. This point is of great significance and will be examined at some length in succeeding paragraphs. Here we shall note merely some subdivisions of the property concept. Thus property may be *real*, as land, or *personal*, as chattels. Again property may be *corporeal* or *incorporeal*; that is, it may be composed of *things* perceptible to the senses, as land or merchandise, or it may be composed of *legal rights*, as the right to receive payment on a debt. Finally, property may be *tangible* or *intangible*; tangible and corporeal property are similar, but intangible property may differ from incorporeal property. Intangible property may represent the right to an *opportunity* to obtain income. Thus the “good will” of a business is valuable, but it does not represent the right to income from an obligation to trade there on the part of customers. Rather, it represents the chance to receive an income because they like to trade there.

These intangible and incorporeal properties from the social viewpoint may well be more valuable than all physical things in a land whose government and people are stable. Though *invisible* they are more significant even than the physical property which we see about us, for it is these rights and opportunities that have led to the production of nearly all physical capital and that will lead to its reproduction when it wears out. Upon them are built both the credit system and the business initiative which have carried us along the road of industrial expansion. The meaning of property in the eyes of the law, then, is of tremendous importance for the modern economic system. In general, the law is concerned with persons, not objects; with relations between persons, not with relations between things; so

that in law property is a bundle of rights and obligations between persons and not a physical object at all.

The Supreme Court's Definition of Property.—The Fifth and Fourteenth amendments to the federal Constitution prohibit the federal and state governments from depriving any person of life, liberty, or property without due process of law. In 1872 the Supreme Court found it necessary to define the meanings of property and liberty as applied to business enterprise. Liberty meant freedom from slavery or personal servitude; property meant the physical things held exclusively for the owner's own use. Thus property was corporeal and tangible. It meant use-value, not exchange-value. So long as the right to *use* the property was unimpaired, legislation which reduced its sale-value or exchange-value was constitutional.

In the quarter century which followed, however, the Court's position on this question underwent a marked change, as John R. Commons has shown in detail in his "Legal Foundations of Capitalism."¹ The Court came to see that value results from the use and income of the property as well as from its title and possession. Thus the power to regulate a business was distinguished from the power to destroy it by circumscribing its rights. In this way the definition of property right was changed so as to embrace not only use-value but also the more inclusive concept of exchange-value, which was based upon expected earning power. Therefore title and possession of physical property could be taken from its owner for public purposes under the power of eminent domain, but only on the condition that an equivalent value based on earning power should be paid so that the owner's assets would not be reduced by the confiscation.

Effects of Regarding Property from the Viewpoint of Value-in-exchange.—Evidently property has no exchange-value unless the owner has access to a market where he can sell his property. Hence the Court completed its new definition of property in 1897 when it said that liberty of access to markets is essential if property is not to be taken without due process of law. *Liberty* thus comes to mean not only the right of the citizen to be free from personal physical restraint, but also the right to live and to

¹ COMMONS, J. R., "Legal Foundations of Capitalism," The Macmillan Company, 1924.

work wherever he wishes, to pursue in the future any lawful avocation he desires.

Too much liberty on the part of competitors, however, would destroy this liberty of the individual. It might wipe out the exchange-value of his business property. For this reason such excess liberty has long been restrained by the courts through the prohibition of "unfair competition." Thus a *good-will value* is recognized as property for it may be bought and sold. If the corporeal and incorporeal property of a manufacturing plant will sell for \$75,000 but the plant will bring \$200,000 on the market because of its expected earning power, the good will is valued at \$125,000. This "property" is of the most ethereal nature, yet its legal and economic significance may be at least as great as that of the visible land and building comprising the real property of the plant.

Withholdal Value.—The right of access to a market involves also the right of *absence* from the market. In an economy of scarcity, the owner enhances the exchange-value of his property by restricting the supply of his goods offered for sale. He decreases the available total of use-values in the market so that he may increase his own exchange-values. Here business aims and engineering ideals part company. The engineer desires to create as many use-values as possible to the end that as many wants are satisfied as may be; the businessman wishes to dispose of no more units than are necessary in order to receive the maximum net income. The businessman is concerned with exchange or withholdal values by means of which he improves his own economic position at the expense of that of his fellow men. In legal terms, economic coercion is permissible while duress is unlawful. Duress of person means threats of personal violence; duress of goods means withholding from a person what rightfully belongs to him and is needed by him; economic coercion usually means withholding from a person what does not legally belong to him, yet is needed by him.

Corporation Franchise-value.—A corporation *franchise* confers a special privilege upon its holder. The nature of this privilege has undergone a marked change during the last century. A corporation franchise originally was a special grant of the sovereign. It permitted the creation of a corporation for a special purpose and has therefore been called a "franchise to be." At

a much later period, general incorporation laws were passed by the states. Thereafter, a corporation could be organized in one state, and so automatically could do business in another state. Thus modern corporations are examples of the "franchise to do," which means that a state permits a corporation to do business within its boundaries although it is not incorporated there. This "franchise to do" has been extended to cover the case of companies that own no more than scattered bits of real property in a state. Such concerns may have a total value on the market which far exceeds the sum of the values of the various separate pieces of real estate and chattels, including securities. The excess is good will or franchise-value.

The most significant aspect of franchise-value is that connected with public utility cases. This problem will be discussed in detail in a later chapter, but it may be remarked here that a special privilege may have a value as against other private persons while it should not have the same value as against the government. In other words, a franchise of this type gives the right to do business with less competition than normally is to be expected. For this reason the income of the business may be higher. Thus the exchange-value of the business, if it is to be sold, will be enhanced by the franchise-value. But suppose it is sold to the very government that granted the franchise in the first place; it does not seem fair to force the government which gave this permission without recompense to pay in order to receive it back again, unless other circumstances have changed materially.

Salability of Contract Rights.—One of the most important developments of modern business law from early common law was that which permitted a contract right to be sold to a third person. The discovery that the promise of *A* to pay *B* is something that can be sold to *C* meant that promises might be used as money. This use is fundamental to the operation of the present economic system.

The first step in this development was that which made an impersonal obligation out of the personal contract to pay. Some contracts are still personal and so are not negotiable. An example is the contract to marry, which cannot be assigned to a third party or transferred on the market. Impersonal contracts, however, were thus freely transferable when the consent of the obligor was no longer required for assignment of the benefit to a

third party. The final step was to protect the rights of the innocent third party in such a way that his title in the negotiable paper might be better than that of the person who sold it to him. For example, *A* owes *B* a debt, in evidence of which *A* gives *B* a promissory note payable to bearer. If *B* loses the note and it is found by *C* before maturity, *C* could not demand payment on it from *A* for he is not a holder in due course who has given value for the instrument; but if *C* sells (negotiates) the note to *D*, who buys it in good faith that *C* had the right to sell, *D* may require *A* to pay him the value of the note at maturity. Under these conditions, such incorporeal property as debts may circulate from hand to hand in the same way as money.

This discussion will serve to point the fact that modern business to an extraordinary extent is based upon confidence. Interdependence enlarges with commerce as it does with technological advance. Concurrently, as each producer becomes specialized, he becomes more ignorant of other fields. Thus he comes to depend more and more upon the confidence he places in the honesty, diligence, and good management of others. This confidence exists largely because of the courts. It is due to the working rules which they establish for business, and to the consistency with which they interpret the fundamental concepts of economics and industry, that men have confidence in the great mass of incorporeal and intangible values which are an outstanding characteristic of the modern world.

Labor "Rights."—As was shown in earlier paragraphs, the change in definition of property has been from use-value to exchange-value. According to the new definition, the privilege of working becomes the *property* and *liberty* of the laborer himself. The meaning of the courts here, however, is not yet clear.

The "labor" which is the laborer's property evidently cannot mean his physical body. His body itself is not transferable and so cannot have exchange-value. What he does sell in the labor bargain is his willingness to use his bodily faculties according to another's commands. He sells his promise to obey: his *good will*. Thus the "property" in which the laborer deals is to be classed as an intangible; it is something whose value depends entirely upon the market situation from moment to moment. Actually, the free laborer is employed at will: there is no obligation on the employer's part to keep him, nor has he any obligation to con-

tinue at work. Under ordinary circumstances, neither employer nor employee can secure damages from each other for failure to fulfill a promise to work. Therefore labor is not property but *opportunity*. The workman does not own the job. He owns the liberty to be continuously bargaining with his employer from day to day to be kept on the job by virtue of his continuous delivery of satisfactory services, which the employer continuously accepts. The laborer is continuously on the labor market.

The tremendous importance of this legal position of the laborer will become apparent in later chapters when we discuss the problems of labor legislation and trade unionism. It seems that we stand upon the threshold of further change in the meanings of liberty and property. The change respecting *business* usage occurred over 50 years ago; the new change will be in terms of *human* usage in the labor problem and may take the form of a restriction upon the present right to withhold work from workmen. If this change is made, however, we may expect a concurrent change which will impose certain duties on labor unions in return for the rights which their members may secure in the job.

Equity and Common Law.—The common-law powers of the court provide redress only when a violation of rights actually has occurred and only when two opposed groups of interest are involved, namely, plaintiff and defendant. Many cases appear in which the rights of more than two parties are concerned, or in which it is desirable to prevent a threatened injury to a right. Such cases may be dealt with by courts of *equity*. For example, both *B* and *C* demand payment of *A* on a single debt. The debtor is willing to pay, but only to one of the parties. He may appeal to the court of equity to arrange that *B* and *C* have their claims to payment settled by the common-law court in order that *A* may discharge his debt by a single payment to one or the other of these parties. Again, *A* may have good reason to fear that the actions of *B* will damage his property rights but the common law provides no remedy until after the damage is done. Then *A* may seek reparation from *B*, who may not be able to provide it. The court of equity will afford *A* protection by the use of an *injunction* which forbids *B* to act in the manner that *A* fears. If *B* so acts nevertheless, he violates the court's order, is thus in contempt of court, and may suffer such penalty as the court shall direct.

The court of equity therefore permits a different settlement of cases; different from the common law, because the latter must award money damages whereas the equity court gives specific relief for each case separately; and more expeditious than the common law, because the cumbersome trial by jury and settlement only after damage is done are not required in equity. The method of equity has developed certain abuses, however, which we shall point out in a later chapter in connection with a discussion of the use of injunctions in labor disputes. The abuses are partly the result of the difference between the workman's view of his rights and the court's view of the property right in labor, and partly the result of the method in equity whereby the judge, upon violation of an injunction, becomes complainant and prosecutor and jury and judge all rolled into one.

Divisions of Law.—The chief ends of the existing legal system are the preservation of the institution of private property, the guaranty of individual liberty, the balancing of individual and social interests, and the furtherance of the public welfare generally. In order to meet these ends, the field of law has been divided into a number of parts in terms of the types of problems to be solved. Thus a person possesses many legal rights merely because of his existence in society. Instances are the right against personal interference or against defamation of character, the privilege to enter into legal relations with others, and the power to prevent trespass or wrongful conversion of property. Violations of these personal rights are called torts. The criminal law is closely allied to the law of torts, for an act constituting a tort also may constitute a crime. A distinction involves the fact that proceedings against a criminal offender are instituted and controlled by an officer of the state rather than by the offended individual since the offense is considered to be against society in general.

The law of property is a broad field in itself. It may deal with the acquisition of property by gift, deed, contract of sale, or inheritance, or it may deal with the kinds of interests that may be acquired in property. Thus the concept of ownership involves a host of rights, and the owner may transfer some of these to other persons while he retains the rest. Furthermore the owner may use his land only in a reasonable manner so that certain kinds of improper uses or nuisances may be restricted or prohibited, as

is done in zoning ordinances. Finally, all these problems are subsidiary to those broad questions found in the field of constitutional law, where the general rules are laid down by means of which the courts steer a course amid the disputes which arise in the daily conduct of economic and business relations.

Custom and Law.—Two apparently opposite theories of law have been formulated. One view holds that law is *made* by the command of a superior to an inferior. It may trace law back to the time of absolute monarchies when the king's will was law. The other view maintains that law is *found* in the customs of the people. It sees chiefly the common law, which has developed from the general custom as to what was right and fair. One theory looks at constitutional and statutory law, while the other refers to the unwritten law formulated piecemeal by the courts.

The two are inseparable, for statutes and constitutions are but dead letters where they do not fit the customs of the people. Both undergo constant change, but the constitutional law tends to resist change to a greater extent than does the common law. As a result, the former is subjected to modification by the Supreme Court through changes in the definition of its terms.¹ These changes follow, at some interval of time, the alterations in business usage which produce new customs and which lead to changes in the common law. Someone must choose between customs, selecting the good and discarding the bad. Whoever chooses is the lawgiver. He establishes the framework of rules of the game within which economic principles and business practice may function. With this fundamental relationship between jurisprudence and economics in mind, we may now proceed to analyze the operation of our economic system in detail.

Problems

26. In 1800 it required 25 pounds of beets to make 1 pound of sugar; in 1882 it required 10 pounds; while now 6 pounds are sufficient. What is the economic significance of this change?

27. "The moving conveyor used in manufacturing concerns is of greater economic significance than the discovery of gold in California." Evaluate this statement.

28. Two scientists, Thomas and Gilchrist, found a way to smelt iron having a phosphorus content, thereby turning to profitable account the

¹ A recent example is to be found in the redefinition of "interstate commerce" which appeared in the famous Supreme Court decisions in the National Labor Relations Act cases in 1937.

extensive iron resources in the Minette mines of Lorraine, Luxemburg, and other districts of western Europe. What has been the significance of this discovery upon the economic relations of France and Germany? Of the United States and Europe?

29. "Since modern industry is more complicated than its predecessors, there has been a gain and not a loss in the worker's skill. Since the working day is shorter, there is less monotony than formerly." Discuss.

30. Which of the following are property: a violin; the violin player's skill; a patent; the local telephone company's right to use the city streets; a promissory note?

31. Distinguish between liberty, right, obligation, and contract.

32. What is the relation between good will and withholdal value for: (a) an engineer; (b) a department store; (c) a public utility?

References

CHEYNEY, A. P.: "Industrial and Social History of England," The Macmillan Company, 1901.

COMMONS, J. R.: "Legal Foundation of Capitalism," The Macmillan Company, 1924.

CUNNINGHAM, W.: "Growth of English Industry and Commerce," Vols. 1 and 2, Cambridge University Press, 1890-1892.

KIMBALL, D. S.: "Industrial Economics," McGraw-Hill Book Company, Inc., 1929.

MUMFORD, LEWIS: "Technics and Civilization," Harcourt, Brace & Company, 1934.

ROBINSON, JAMES HARVEY: "The Human Comedy," Harper & Brothers, 1937.

CHAPTER V

BUSINESS UNITS

Industry and trade are conducted by individuals or by associations of individuals. The going concern which undertakes the conduct of business may be organized in any one of four ways, namely, as a proprietorship, a partnership, a corporation, or a cooperative enterprise. It is the purpose of this chapter to note the distinctive features of these forms of the business unit, to describe their advantages and disadvantages, and to indicate some of the social implications of the most common form, the corporation.

Proprietorship.—The single proprietorship is the simplest form of business organization and historically preceded the other types. In the one-man unit one person owns the business; puts in all the capital, either out of his own resources or by borrowing it on personal notes; assumes all the chance of gain or loss; and undertakes to handle personally a part, if not all, of the organizing, supervising, and mercantile functions. The owner is liable to the creditors of his enterprise not only to the extent of the assets of the business but also to the full extent of his worldly wealth. If his enterprise fails, its creditors may lay claim, with some exceptions, to any other property he possesses until all are paid in full. Herein lies the chief disadvantage of this type of business, for there is always the danger that the savings of a lifetime may be engulfed along with the business in the event of failure. For this reason some proprietors transfer title to personal property to their wives or other persons in order to reduce the personal liability involved. Other disadvantages are the small volume of capital—and hence the small scale of operation—to which the one-man business usually is restricted, and the wide managerial ability and experience necessary if one man is to conduct the enterprise successfully.

The proprietorship form of business organization enjoys several advantages. It is the easiest and cheapest form to establish or to close out. Managerial authority and profits need not be shared

with others. One-man ownership excels in many small businesses because the variety and quantity of detail in proportion to size are kept within the control of the person most concerned with profitable operation. A distinct advantage of the one-man business is the owner's untrammelled ability to make decisions quickly when emergencies arise. Thus the fields mainly organized on the proprietorship basis are agriculture, small retail merchandising, and professional service of all kinds.

Partnership.—A partnership is an association of two or more persons to carry on, as co-owners, a legal business for profit. The partnership resembles the proprietorship except that it is owned by two or more persons, all of whom have a voice in its management, share in the chance of gain or loss, and ordinarily participate in the actual work of organization and management. However, one partner cannot sell his share in the firm to another person without the consent of the other partners, nor can the life of the partnership survive the death, bankruptcy, or voluntary withdrawal of any one of the partners. A further element in its personal character is the fact that the partners are not only liable *jointly* for the debts and obligations of the partnership but also each partner is separately liable for *all* the partnership debts. If one of the partners makes an agreement which turns out disastrously, even though he made it without the approval of the others, each or all must stand ready to make good the claims of creditors with any property, personal or otherwise, which he or they may possess.

The partnership permits the use of greater amounts of capital than does the proprietorship. Indeed, some partnerships contain "silent partners," who contribute capital to the enterprise but who do not take an active part in its management. The partnership also has the advantage of combining the judgment of several men, and it allows the partners to specialize as managers of various parts of the business. However, the partnership is not so readily established as is the proprietorship, for the partners must be selected with great care, since they must trust each other implicitly, and a detailed partnership agreement should be drawn up and signed. Partnerships are most common among physicians, lawyers, consulting engineers, and others rendering professional services, and in certain lines of manufacturing and merchandising.

The Corporation.—A corporation is an artificial or legal person whose existence is derived from the law. The corporation is formed by three or more incorporators (under most state laws), who secure a charter from the state. This charter gives the corporation a legal existence and states the activities in which it may engage. As a legal entity, its existence does not depend on the lives or fortunes of the persons associated with it, but it can carry on business in the same manner as an individual person. Thus it can buy and sell property, sue or be sued in the courts in its own name, and so on.

According to a survey conducted by the Twentieth Century Fund, "about 57 percent of all economic activity [in the United States] is incorporated, the range being from 6 percent in agriculture to 96 percent in mining and quarrying. Of 388,564 active corporations submitting balance sheets to the Bureau of Internal Revenue in 1933, there were 594 that had assets of at least \$50 million each. This handful of giants owned 53 percent of total corporate wealth. On the other hand, there were 211,586 small corporations, each with assets under \$50,000. In the aggregate, they owned only 1.4 percent of the corporate wealth."¹

Stockholders.—The capital required to start the business of a corporation is divided into a large number of equal parts, or shares, and these shares are purchased by investors in whatever number desired. Ownership of stock is evidenced by stock certificates. These shares are called the stock of the corporation; hence the terms "share of stock" and "capital stock" (or total number of shares in the business). The investors who purchase shares of stock become part owners in the business and are called *stockholders*.

Liability.—Since the corporation legally is a separate individual, contracts with it are not contracts with the persons who own the corporation or who conduct its business. Thus an owner's liability in a corporation is *limited* and is unlike the liability of proprietors or partners. This feature of limited liability enables the corporation to raise larger quantities of capital than either the proprietorship or the partnership. When stock is bought from a corporation, the liability of the buyer is limited to the par value, if any, and to the stated value if it is no-par stock. Generally speaking, a stockholder's liability is limited to the amount actually

¹ "How Profitable Is Big Business?" p. 141.

paid for the shares he owns. If the corporation becomes bankrupt, he may lose this much but no more.

In some states, however, stockholders in banking institutions are subject to *double liability*. They may be liable for a sum equal to the par value in event of failure, in addition to the amount already contributed when the stock was purchased. This measure is, of course, for the protection of the bank's depositors, since they are in a position quite different from that of creditors, who are supposed to know the financial situation of an enterprise before they grant credit thereto. Double liability provisions gradually are being removed from our banking regulations.

Securities Issued.—Corporations issue and offer to the investing public a wide range of securities in order to accumulate the great amounts of capital needed for large undertakings. Subject to certain limitations, some of the liabilities of a corporation may be listed in the order of their priority, those which ordinarily must be paid first coming at the beginning of the list, as in Table 4.

TABLE 4.—ORDER OF CORPORATE LIABILITY

Liability	To Whom Paid	
Wages.....	Workers	
Accounts payable	} incurred under receivership	} Other concerns
Promissory notes			Creditors
First mortgage bonds.....	Creditors	
Second mortgage bonds.....	Creditors	
Collateral trust bonds.....	Creditors	
* Debenture bonds.....	Creditors	
Preferred stock (usual case).....	Owners	
Common stock.....	Owners	

A given corporation may not issue all these types of securities, nor have all the possible types been listed. The more common types of bonds and stocks will be discussed and their priority as to interest or dividends, as well as to principal, will be indicated.

Bonds.—The *creditors* of a corporation may be divided into two groups. Some of the creditors are persons who have claims against it because of the performance of labor or the sale of goods to it. The others are persons who have loaned money to the corporation upon a specific type of formal promise to pay, and are *bondholders*.

Bonds bear a definite rate of *interest* payable at stated intervals. A majority of the bondholders, being joint mortgagees, usually may foreclose and take control of the property for reorganization

or sale according to the terms of the mortgage agreement if interest payments are not met. Most bonds bear a definite *maturity date*, at which time the principal is to be repaid. In case of bankruptcy, bondholders' rights ordinarily must be satisfied fully before stockholders receive anything. Bonds, therefore, generally are less risky and often yield lower rates of return than do stocks.

Mortgage bonds are the most common variety of the credit series. The security of a given issue is a mortgage on the physical plant of the corporation and on its general credit. This mortgage carries a statement of the rights of the bondholders. Each bond of the series represents a share in the mortgage rights. If there are *second mortgage bonds*, they may have as security that part of the plant and equipment not required to support the first mortgage issue, the first mortgage series taking priority in payment of interest and principal. A variation is the *equipment bond* which, in the case of a railroad, for example, would have as security the rolling stock or other specified equipment of the company.

Collateral trust bonds have as their security the stock, bonds, or other paper of other corporations whose securities happen to be owned by the issuing corporation. Debenture bonds and income bonds are based largely on the expected earnings of the corporation.

Stock.—The *owners* of a corporation, who are its stockholders, may hold several types of securities. The main division in stocks is that between *preferred* and *common*. Preferred stock has a definitely specified rate of return which, though not guaranteed, is generally to be paid before dividends on the common stock are declared, if there are earnings to distribute. If the enterprise prospers, the dividend rate may be much higher on common stock, though this class has no specified rate of return. If the preference also pertains to assets, preferred stock is paid in full in event of bankruptcy before common stock receives any payment.

Special classes of preferred stock are those which are *cumulative* or *participating* or both. In the case of cumulative preferred stock, dividend deficits in any year or years are carried over and must be paid in succeeding years before common stock can secure any return. Non-cumulative preferred, or any common stock, having once passed a dividend period without payment, may not claim payment at a later date. Participating preferred stock, if

its dividend has been paid, shares equally with common stock, after the common stock has received a dividend equal to that of the preferred. This form of stock is not often found today. Other types of preferred stock can receive no more than their stated rates of return. Preferred stock ordinarily does not carry voting privileges, though this distinction does not hold in the case of railroad stocks.

Common stock now is frequently divided into Class A and Class B shares. The former shares have no voting rights and are merely instruments of investment similar to preferred stock and income bonds. Class B shares, on the other hand, may be a sharply limited issue but may carry all the voting rights. Thus a few shares of a particular stock may control the entire investment and policy of a great corporation. Holders of common stock enjoy no specified rate of return and are the last to be paid in the event of bankruptcy, if any assets remain after satisfying the demands of all other creditors and owners. This situation is partially counteracted by the fact that a successful concern may pay a high dividend rate on its common stock.

Ownership vs. Management.—Preferred stock, as indicated above, sometimes has voting power, though this right often is reserved for the common stock and in many recent issues part of the latter also has lost its voting power. Why is it possible to sell non-voting common stock? Some persons are stockholders not because they wish to be directing owners of a business but because they merely wish to be investors. As long as dividends are declared they are quite content to let someone else exercise the authority of ownership. If dividends are not forthcoming, instead of utilizing their voting rights, many individuals may sell their shares and invest the proceeds in some other business that appears to be more profitable.

Many persons who hold voting common stock either cannot or do not effectively exercise their voting rights. Although each share (x) of such stock carries one vote, direction of the corporation's activities requires control of no more than 51 percent of the stock $(Nx + 1)/2$. As a matter of fact, if the stock ownership is widely scattered, a much smaller portion, say $(N^x + 1)/10$, will give effective control. For example, collective action by all the stockholders in a corporation like the American Telephone and Telegraph Company is impossible. This corporation has

over 640,000 stockholders located in all parts of the world, many of whom hold but a few shares each. In the light of voting procedure, their lack of managerial strength is obvious.

Voting.—Each share of stock with voting rights carries one vote. Voting takes place at the annual stockholders' meetings called to elect members of the board of directors and other officers; and at annual and special meetings upon questions of general policy. In practice, much of the voting is done by *proxy*; that is, the stockholders, not being able or not caring to attend the meetings, designate someone else to do their voting for them. So common is this practice that the stockholders usually receive, along with the printed notice of the meeting, a blank form on which to sign over their voting rights to a proxy. As many stockholders are not much interested in management if dividend payments are continued, they are likely to designate as proxy whomever the successful management suggests. In this way a strongly interested group may keep control of the corporation's management while owning but little of the voting stock. By means of this voting procedure, a board of directors and a set of executive officers, who may be members of the board, are elected as managers to conduct the business for the stockholders.

Par Value.—Another important distinction in stocks is that between stock of *par value* and stock of *no par value*. Any share of stock represents a fractional part of the assets of the business, depending upon the amount of the assets less the liabilities and upon the number of shares of stock. When stock is issued it is commonly given a "nominal value" or par value. The par value of a share of stock at the time when it is first issued is supposed, in the eyes of the law, to represent the actual value of a proportional share of the enterprise. This very seldom occurs, since the shares of stock must be sold to the investing public and the process is an expensive one.

After a business is organized, if it does not prosper the stock may sell on the market for less than par or, if it does prosper, for more than par. Hence par value often is meaningless, and an increasing number of corporations are issuing no-par stock in which a nominal valuation has not been named at the time of issue. However, a disadvantage of no-par stock is the fact that it permits unscrupulous directors to manipulate stock values to the detriment of stockholders.

Capitalization.—The *capitalization* of a business usually means the sum of the nominal values placed upon the securities of a corporation by its officers. This total par value presumably is equal to the total assets of the corporation less its current liabilities. Thus to say that a corporation is capitalized at \$1,000,000 means that the nominal value of the authorized securities, both stocks and bonds, is said to reach such a sum.

The process of selling stock to investors is an expensive one. Allowing 10 percent for selling costs, the issuance of \$1,000,000 par value of stock would bring in to the corporation \$900,000. Hence the capitalization, if the company is a newly established one, would exceed the assets by \$100,000. In other words, the corporation would be *overcapitalized* by that amount. Another name for the excessive par value of the stock issued is “watered stock.”

If the corporation is successful and does not pay out all its earnings as dividends but reinvests part of them in the business, the \$100,000 “deficit” will disappear, the “water” will have been “squeezed out,” and the enterprise will no longer be overcapitalized. In fact, if this process continues, the concern may come to be *undercapitalized*. It should be understood that these terms refer throughout only to stock with a “nominal” or par value.

Effects of Overcapitalization.—Overcapitalization may be harmless or harmful, depending on the circumstances of the case. Considered first from the standpoint of the stockholders, overcapitalization may rob the real investors of their rightful dividends. The earnings of the corporation must be distributed over all the stock outstanding, watered or otherwise, so that overcapitalization reduces the earnings per share. The security of the investment is also less than it appears to be, and this may be unfair to the prospective stock purchaser.

From the viewpoint of the general public, overcapitalization of corporations in unregulated lines of competitive or monopolistic business is practically harmless, while that of corporations of the public utility type, whose rates are set by a regulatory body, may be very harmful indeed. Public utility rates presumably are set at a point that will yield a “fair” return on a “reasonable” investment. The amount of the investment is thus a very important item. If the utility can inflate the value of its property, that is to say, if it can overcapitalize, it may be able to have the rates which it charges for its services set on the excessive basis

of the inflated valuation. Consumers thus would be forced to pay more for these services than would otherwise be necessary. Ordinarily speaking, such enhancement of prices is impossible for competitive businesses, since the prices of their products are determined in a totally different manner (see Prob. 34).

Cash Dividends.—*Cash* dividends should represent a division of the *profits* of the business among the stockholders, though dividends sometimes are paid out of capital. The usual corporate practice is to retain earnings during the first few years, instead of distributing them to the stockholders. In this way the corporation will have additional reserves at its command in case of an adverse turn in affairs. Retention of earnings, furthermore, represents one of the most important ways in which a corporation may expand the scale of its activities. Thus Armour and Company began in 1868 with an investment of \$16,000 and has since received \$14,000,000 from the sale of additional stock, but it has retained in the business profits to the amount of \$140,000,000. The Ford Motor Company's growth was financed almost entirely by the retention of profits, and many other examples could be cited. If we remember that a share of stock merely represents a certain proportion of ownership in the business, we can readily see that the value represented by a share of stock increases as the value of the business increases. Corporations, then, ordinarily pay a nominal rate of cash dividends, and retain the rest of the earnings in the enterprise. The tax upon corporate surpluses, however, may lead to a reversal of this policy for under such a tax program corporate officials may elect to distribute the profits directly to the stockholders as cash dividends.

Stock Dividends.—If the company continues to prosper and follows a fairly conservative dividend policy, we may expect it to become undercapitalized. Thus the market value of a share of stock would increase. The directors may now decide to increase the number of shares and to give the new shares to the present stockholders in proportion, of course, to their present holdings, thus capitalizing the surplus. This increase in the number of shares of stock, when *given* to the stockholders, is called a stock dividend and is to be distinguished carefully from a *cash dividend* paid on stock.

Consider a corporation having 100,000 shares of stock outstanding. Suppose the corporation was worth \$10,000,000, and

each share of the stock had a market price of \$100. Thus in January, 1936, there was no overcapitalization. After January, 1937, earnings retained brought the value of a share to \$150 and of the corporation to \$15,000,000. If, now, we owned half the shares, or 50,000, the value of our holdings in the company was one-half of \$15,000,000, or \$7,500,000.

Suppose that a 50 percent stock dividend was declared. We received one-half, or 25,000, of the 50,000 additional shares that were issued. We still owned one-half of the corporation, the value of our holdings being \$7,500,000 as before. Thus a stock dividend does not change the proportion of ownership in a company, nor does it represent a distribution of earnings.

Stock Dividends to Common-share Holders Not Real Income.—The United States Supreme Court accordingly holds that stock dividends to the owners of common stock are not income and so are not taxable as such. This presupposes that each \$150 share of original stock will fall in value, after the stock dividend, to represent 1/150,000 of the ownership, or \$100, instead of the original 1/100,000 of ownership. This is not the case. Stock dividends lead overoptimistic investors to believe the corporation richer than they thought it to be, though they may be entirely wrong. Another reason rests upon the fairly definite cash-dividend policy of many corporations. The market price of the original shares does not often fall so far as we should otherwise expect, and the market value of each of the shares is of course the same as that of every other identical share. Thus a person's *paper* wealth actually may be increased by a stock dividend, though his gain will not be a *realized* one unless he disposes of the securities at not less than this market price or unless he later receives additional income on the extra shares in the form of cash dividends.

Stock dividends were quite common until 1929. In the case of the National Dairy Products Corporation, for example, the original issue of stock at \$33 a share took place in 1926. Then came a 33 $\frac{1}{3}$ percent stock dividend, followed by a 100 percent stock dividend. Each share of the newest stock sold at \$78 in August, 1929, near the peak of the market boom, a total increase in market value of 630 percent in 3 years. If we inquire why stock dividends are used, we shall find at least three important reasons. One of them, as suggested above, is the reduction of the degree of

undercapitalization. Another reason lies in the attempt, far too often successful, of directors to deceive the stockholders. Thus if there are no profits for cash dividends, a stock dividend may be declared in order to satisfy the stockholders, who are thus made happy, having secured little or nothing. A third reason lies in the desire to conceal the large earnings of a very successful enterprise. Cash dividends of 32 percent on each share of stock arouse much more suspicion than dividends of 8 percent per share, distributing the same amount of earnings to the same persons but over four times as many shares. Stock dividends, then, are sometimes used to allay stockholder unrest, to guard against public suspicion of "profiteering," or to divert the curiosity or cupidity of possible competitors.

Corporation Accounts and Statements.—Before the officers of a corporation properly may order the payment of dividends, or may control other business activities, they must know the financial status of the company. Detailed cost records must be kept. Income must be apportioned among the various activities of the business. Cost accounting, however, can be something more than mere bookkeeping. It can be an efficiency device, a profit barometer, and a tool for control. By means of inventory control an accounting system can avoid waste through overstocking or loss from inadequate supply. Production can be planned in advance, and the profitable or unprofitable parts of a business can be more readily discovered.

The Balance Sheet.—Accounting procedure yields two summaries of the financial position of a business. One of these is the *balance sheet*, which represents an instantaneous cross section of the accounts at a given moment of time. This statement balances the assets of the business against its liabilities. Since double-entry bookkeeping must show a balance between credits and debits, the owner's equity in the business is counted as a liability of the concern while its intangible values are reckoned as assets. The business is solvent only when the owner's equity in it is a positive sum.

The balance sheet for The Republic Steel Corporation, shown in Table 5, arrays the fixed and current assets of \$343,949,673 against the fixed and current liabilities of the same amount. The chief asset of this company is composed of plant, property, and equipment, while the leading asset of a merchandising cor-

TABLE 5.—THE REPUBLIC STEEL CORPORATION: CONSOLIDATED BALANCE SHEET, DECEMBER 31, 1936

Assets		Liabilities	
Property, plant, and equipment.....	\$360,016,123	Funded debt	\$110,974,148
Less reserve for depreciation, depletion, etc.....	154,855,834	Prior preferred stock	28,230,350
Net property.....	\$205,160,289	Preferred stock	11,959,700
Other assets: (securities owned, sinking funds, deferred charges, etc.).....	45,265,745	Common stock.....	93,995,228
Current assets:		Stock guaranteed.	718,153
Cash.....	\$13,350,301	Reserves..	13,054,977
Notes and accounts receivable ..	22,158,016	Surplus	64,299,963
Inventory....	58,015,322	Current liabilities:	
Total current assets.....	93,523,639	Accounts payable... ..	\$13,279,981
Total assets.....	\$343,949,673	Accrued taxes	7,437,173
		Total current liabilities ..	20,717,154
		Total liabilities	\$343,949,673

poration might be found under the heading of inventory. Current assets and liabilities are cash, inventory, and items maturing within 12 months. The net working capital of the company is \$72,806,485, the balance of total current assets over total current liabilities. In this example, the item which serves to bring the assets and liabilities into balance is the surplus account. Thus if a net profit of \$5,000,000 were made during 1937 and the entire amount is to be retained in the business, the Surplus item in 1937 would be changed to read \$69,299,963 and some item or items on the assets side, such as Cash or Inventory, would show a like increase.

The Profit and Loss Statement.—The second summary of the financial position is the *income or profit and loss statement*, which represents a summary of the results of doing business over a stated period of time. This statement lists all the income received by the business during the stated period and deducts from this amount all payments made to others by the business. If the balance remaining is positive the business has been profitable and the net amount of the income statement is transferred to the surplus account of the balance sheet as an increase in the owners' equity, or a part or all of this net amount may be withdrawn from the concern by the owners as profits. If the balance is negative the business has "lost money," the transfer must be *from* the surplus account, so that the owners' equity would be reduced.

Incorporation.—In the enactment of corporation laws some states have sought to protect minority stockholders, creditors,

TABLE 6.—THE REPUBLIC STEEL CORPORATION: CONSOLIDATED INCOME ACCOUNT FOR 1936

Net sales.....	\$218,317,399
Cost of sales.....	\$158,532,483
Plant repair and maintenance.....	18,087,751
Total cost of sales.....	176,620,234
Gross profit from operation.....	\$ 41,697,165
Selling, general, and administrative expense.....	13,178,917
Operating income.....	\$ 28,518,248
Other income.....	1,256,666
Total income.....	\$ 29,774,914
Deductions:	
Depreciation and depletion	\$ 10,130,485
Interest on indebtedness	4,815,583
Other deductions	2,241,924
Provision for:	
Federal income tax	2,050,000
Federal surtax on undistributed profits..	950,000
Total deductions.....	20,187,992
Net income.....	\$ 9,586,922
Dividends:	
Prior preferred dividends	\$ 2,874,113
Preferred dividends	1,435,164
Common dividends	
Total dividends.....	4,309,277
Surplus after dividends	\$ 5,277,645

and the general public against the unfair practices of organizers and managers. However, legislation varies widely from state to state. States with the lowest standards tend to govern the situation since a company may incorporate in any state, regardless of where its business is to be conducted. New Jersey was for years, and Delaware is today, the favorite place of incorporation for companies that are organized outside the state in which they do most of their business. Thus the home offices of some 12,000 of the largest corporations in the United States are to be found in one room on one floor of an office building in Wilmington, Del. There are several reasons for this condition, among the most important of which are cheaper incorporation charges and lower annual franchise fees. Promoters in New York City, for example, may incorporate a new business more speedily in Delaware than elsewhere. Such a corporation allows its promoters and directors greater freedom to change the by-laws and the rights of

the various stockholders than is usual. Finally, the state of Delaware is convenient for directors but not for stockholders at the time of annual meetings; thus the directors may more readily obtain proxies and need not be concerned about the presence of the stockholders themselves at these meetings.

Federal Incorporation.—Many people consider this situation deplorable. Some oppose it because the many differences between state laws increase the difficulty of investors in understanding the rights and limitations which accompany investment in various businesses so that the opportunities for fraud are greatly enhanced. Other persons decry state incorporation because they object to the specific provisions, or lack of provisions, in the corporation laws of these states.

Federal incorporation of all corporations engaged in interstate trade is advocated by leading industrialists and economists as a remedy for these evils. This requirement has been opposed in the past because of a fear that "state's rights" would be curtailed, that a state could no longer control the incorporation of enterprises doing business within its borders. Today most states actually have lost their right to control such enterprises because these concerns incorporate in Delaware. Under federal control each state at least would retain a voice in framing the laws of federal incorporation. The alternative is between no state control and an equal share in federal control.

Corporation Promotion.—The promoters of new corporations, or of consolidations or reorganizations of old concerns, are to be found chiefly in the banking field. Promotions and new issues of securities generally take place on the crest of the wave of prosperity, since the stimulus of a speculative market then materially aids these financial operations. In obtaining properties for consolidation or reorganization, the normal limit of purchase price on the part of the promoters is about ten times the net earnings of the enterprise, though sometimes promoters have not hesitated to overpass the normal limit in their zeal for a quick turnover.

Underwriting.—The promotion of stock issues generally is handled through the process of *underwriting*. This may be done by an individual banker or by a group of bankers called a *banking syndicate*. Suppose corporation X wishes to place a million shares of preferred stock in the hands of investors in order to

secure funds for the conduct of its business. The stock may be given a par value of \$100. The whole issue is sold as a unit to the bankers, for example, at \$90 per share. The bankers engaged in the transaction are thus underwriters; they have purchased the entire issue, and it is incumbent upon them to sell it to the investing public. The corporation has secured its money at once and may go about its business. The underwriting bankers now sell the stock piecemeal to investors at, let us say, \$98 per share. Under these conditions many investors believe they are getting a bargain, for the price is \$2 below the par value, when actually the corporation secures \$8 less than they have paid. This difference between the purchase price and the selling price, on the part of the underwriters, covers their selling costs and profits.

Underwriters frequently retain a block of the stock for themselves as part payment for engineering the transaction. This block generally is composed of voting stock. The bankers insist that investors have purchased the shares because of the good name of the underwriters and that therefore the latter must have voting power in order to control the corporation for their own protection. An example, of which there are many, is that of a hydroelectric enterprise at Conowingo, Md., on the Susquehanna River, which was to cost \$52,220,000. The proposed financial setup included the sale of bonds to the amount of \$35,410,000 and of preferred stock to the amount of \$16,810,000, thus wholly paying for the project. In addition, a large number of no-par common shares were to be issued: Class A common, which was to be given away to "sweeten" the distribution of the preferred stock, and Class B common, carrying sole voting power, which would not be offered to investors at all but would be retained by the underwriters without payment on their part.

Corporate Consolidation.—The postwar years have seen many mergers of business units. The various forms which these consolidations have assumed have been dictated, on the one hand, by the interests of the participants and, on the other, by the limitations imposed by the government. Mergers are not new economic phenomena. They have existed under different names for many years. George Washington mentioned them as being inimical to the public interest, and before his time they were made a special subject for investigation and discussion in other countries. It was in the latter part of the nineteenth century, how-

ever, that the merger movement first began to assume national proportions under the stress of severe competition between large corporations. This was the era of the trust and of the "anti-trust" activities of President Theodore Roosevelt and others.

Trusts.—Among several uses of the word "trust," two must be distinguished. The term may refer to a *trust company* or to the *trust department* of a bank. The primary functions of such organizations are to act as agents, trustees, or custodians whether for individuals, estates, or corporations. On the other hand, the word *trust* may refer to a means of securing cooperation between corporations whereby relatively few persons may control many different enterprises. It is this latter type with which we are now concerned.

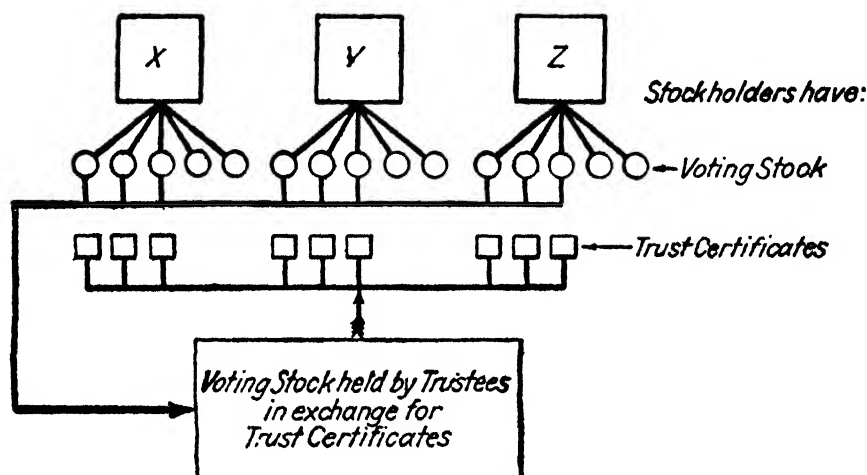


FIG. 5.—Trust formation.

Suppose three companies X, Y, and Z are to be formed into a trust. A majority of the voting stock in each company is turned over to trustees for safekeeping, in exchange for *trust certificates* indicating ownership of the stock and the right to receive dividends thereon but not the right to vote. The promoters, through the trustees, therefore hold a majority of the voting rights of each company. They can thus control the activities of companies X, Y, and Z in such a way as greatly to reduce the competition between them and presumably to permit greater profits, because of the higher prices X, Y, and Z may now charge. Hence all the stockholders may receive larger dividends. This explains their readiness to give up their shares in exchange for trust certificates. Companies X, Y, and Z retain their original identities unchanged, for the only alteration is in the control of the voting rights.

Trust agreements, in 1890 and thereafter, were declared illegal by various American courts, on the ground that corporations did not have power to make trust agreements and that the trust agreement stifled competition between the formerly independent companies concerned and so was in restraint of trade. This certainly was the purpose that was meant to be served by the trust arrangement.

Holding Companies.—These court decisions made another form of organization necessary if the desired end was to be accomplished. The *holding company* accordingly was devised. An entirely new corporation, the holding company, is set up under this system for the express purpose of *owning* a majority of the

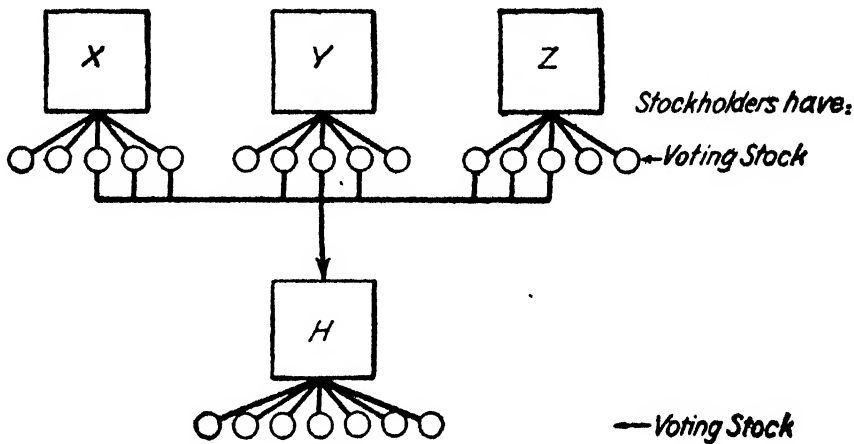


FIG. 6.—Holding company formation.

voting stock of X, Y, and Z; of receiving the dividends thereon; and of controlling those companies by means of the voting rights of the stock the holding company owns. The holding company in turn issues various kinds of securities. These may be given to the original stockholders in X, Y, and Z in exchange for their stock, or the securities may be sold on the investment market and the proceeds used to purchase a controlling interest in X, Y, and Z. The dividends on the stock of X, Y, and Z represent the major source of income of H, the holding company; the dividends paid by H, therefore, depend primarily on those of X, Y, and Z. Thus if X is prosperous while Y and Z are not, H still may succeed in paying dividends. However, H is always in a position to bring considerable pressure to bear on X, Y, and Z to show profits and declare dividends, no matter how they are obtained.

Pyramided Holding Companies.—The process of centralizing control need not stop with the one step illustrated on p. 97. The holding company *H* might be controlled by another, this one by a

TABLE 7.—EXAMPLE OF PYRAMIDED HOLDING COMPANY EARNINGS*

Organiza- tion	Securities issued	Amount outstanding	Interest and dividends	Remarks
Operating company	5 percent bonds	\$ 60,000,000	\$3,000,000	An 8 percent return on the total capitalization of \$100,000,000 yields \$8,000,000 income, leaving a return of \$3,600,000 to common stock, or 18 percent per annum.
	7 percent preferred stock	20,000,000	1,400,000	
	Common stock	20,000,000	3,600,000	
	Total	\$100,000,000	\$8,000,000	
First holding company	5 percent bonds	\$ 10,000,000	\$ 500,000	Holding company owns entire \$20,000,000 of the above common stock; the promoters hold \$5,000,000 common stock here, instead of \$20,000,000 above with \$2,750,000 income, or 55 percent per annum.
	7 percent preferred stock	5,000,000	350,000	
	Common stock	5,000,000	2,750,000	
	Total	\$ 20,000,000	\$3,600,000	
Second holding company	5 percent bonds	\$ 3,000,000	\$ 150,000	Holding company owns entire \$5,000,000 of the above common stock; the promoters hold \$1,000,000 common stock here, instead of \$5,000,000 above with \$2,530,000 income, or 253 percent per annum.
	7 percent preferred stock	1,000,000	70,000	
	Common stock	1,000,000	2,530,000	
	Total	\$ 5,000,000	\$2,750,000	
Third holding company	5 percent bonds	\$ 600,000	\$ 30,000	Holding company owns entire \$1,000,000 of the above common stock; the promoters hold \$200,000 common stock here, instead of \$1,000,000 above with \$2,706,000 income, or 1,353 percent per annum.
	7 percent preferred stock	200,000	14,000	
	Common stock	200,000	2,706,000	
	Total	\$ 1,000,000	\$2,750,000	

* It is assumed that each holding company owns all the common stock of the previous company; that at each stage the promoters retain all the common stock of the last holding company; and that the promoters secure all income not required to pay interest and dividends on all prior securities.

third, and so on. Thus a small amount of capital may exercise very wide control. For example, the Van Sweringen Railroad System was valued at over \$2,000,000,000 in 1929, but it could be controlled by an investment of literally less than zero because of

its involved holding company structure, whose original formation had yielded the Van Sweringen brothers a net profit of \$75,000.

The use of the holding company method of unifying control has been carried farthest in the field of the public utilities. Thirteen holding company groups control 75 percent of the privately owned electric utility industry in the United States and three groups, United Corporation, Electric Bond and Share, and the Insull group, control 40 percent of the industry.

One instance of the pyramiding of electric holding companies is as follows:¹

1. Dillon, Read and Company have a major interest in:
2. United States and Foreign Securities Corporation, an investment trust, which owns 80 percent of the voting stock of:
3. United States and International Securities Corporation, an investment trust, which owns 10 percent of the voting stock of:
4. United Light and Power Company, a holding company with over 60 subsidiaries, which owns 99 percent of the voting stock of:
5. United Light and Railways Company, a leading subsidiary holding company, which owns 100 percent of the voting stock of:
6. Continental Gas and Electric Corporation, a secondary holding company, which owns 99 percent of the voting stock of:
7. Columbus and Southern Ohio Electric Company, an operating utility.

A similar condition exists in the natural gas field, where 11 holding company systems control 80 percent of the pipe lines of the nation.

Holding Company Disadvantages.—Holding company organization is highly provocative of unwarranted concentration of power. A further serious defect of such overdevelopment is the temptation afforded to prestidigitation, manipulation, and chicanery. Sound and defensible management shades off almost imperceptibly under stress of self-interest, given such concentration of control as we have indicated, into all sorts of nefarious dealings. Practically all of them will lie within the domain of financial activity. Another important indictment against the overdeveloped holding corporation in the public field has to do with rate regulation. Under the terrific involution of accounts it may become practically impossible for a commission to allocate costs and to determine earnings as related to the investment. The holding company is exposed also to the temptation to exploit its subsidiaries, taking its own profit by undue enhancement of the operating

¹ *Standard Corporation Records*, Standard Statistics Company, Inc., 1936.

expenses of the local concerns. This is particularly true of "service" companies that are controlled by the holding corporations owning the basic operating enterprises, for the latter sometimes are required to patronize these service companies at exorbitant rates.

Advantages of Consolidation.—Although there are many reasons for consolidation, most of them may be grouped under one of four headings. The desire to obtain *monopoly profits* leads to consolidations of competing plants in non-utility fields. Most public utilities, of course, are granted monopolistic franchises so this point is of minor significance for them. The desire for *promotional profits* keeps many financiers constantly on the watch for merger opportunities. Consolidation to obtain *efficiency profits* may be due to advantages from large-scale production, merchandising, finance, or interconnection of properties or it may be due to the fact that inefficient plants may be withdrawn from production by the consolidation so that only the better plants may remain in use. Consolidation to bolster up a weak company by combining it with a strong one is an effort to *prevent losses* and may present the only alternative to failure. This condition is of marked significance for the public regulation of the railroad industry, as we shall see in a later chapter.

The motives underlying consolidation are closely interrelated. The merger of companies, as the businessman commonly views it, is merely a device to reduce risk and to stabilize income. To him it is a form of insurance against loss and therefore is approved as such. From the standpoint of social well-being, however, the test of the desirability of a given merger should be whether it really does introduce new efficiencies or whether it merely permits one competitor to crush another.

The pyramiding of equities that occurs in many different ways in holding company organization likewise is commonly regarded as a further extension of the principles of risk distribution and income stabilization. Undoubtedly this result often is accomplished, but in the process there is sometimes such a loss of responsibility to workers, to investors, and to the general public that the great complexity of the resulting structure may outweigh the social advantages it may provide.

Recent Corporate Developments.—The tremendous importance of the corporation in modern economic life has been indicated in a

striking manner by a penetrating study by A. A. Berle and G. C. Means, entitled "The Modern Corporation and Private Property."¹ According to this study, $\frac{7}{100}$ of 1 percent of the non-banking corporations in the United States—200 out of about 300,000—in 1929 held almost 50 percent of the non-banking corporate wealth, or 22 percent of the total wealth of the nation. These 200 largest corporations received about 43 percent of the non-banking corporate income. Their rate of growth was markedly greater than that of the great mass of smaller corporations, so that a continuation of this rate might result in the control of all corporate activity by this handful of companies by about 1965, although the depression beginning in 1930 materially reduced this rate of growth.

The Profits of "Big Business."—A significant study of corporate income has been made under the auspices of the Twentieth Century Fund, Inc.² From the viewpoint of the profit and loss statement, large size appears to *stabilize* income. Thus the rate of profit and the rate of loss for large corporations with assets over \$50,000,000 have been lower in the years 1931 and 1933 than the rates for small corporations with assets less than \$50,000, when "profit" refers to the net income on net worth or the total profit on total capitalization. Banking corporations evidence the fact that large size, on the average, is accompanied by the advantage of more favorable operating results. In general, small corporations show a higher rate of turnover of capitalization—do more business in relation to invested capital—than do the large companies. This fact may explain why the rate of profit in small businesses in good times often is higher than in the large units. Finally, the percentage of net income paid in dividends is highest for the large corporations. In terms of the balance sheet, large corporations rely more upon stockholders and less upon lenders than do the smaller ones. Thus 78 percent of borrowed capital in 1933 was subject to the call of creditors for the smallest corporations while only 17 percent of the capital of the largest class was of this type. Surplus and undivided profits also are much more important accounts for the large than for the small companies.

¹ BERLE, A. A., and G. C. MEANS, "The Modern Corporation and Private Property," The Macmillan Company, 1933.

² "How Profitable Is Big Business?" 1937.

Interlocking Directorates.—The control of the nation's corporations rests in the hands of an extremely small minority of the population. Men who are directors of one corporation frequently are upon the boards of directors of other companies as well. These interlocking directorships place the control of many corporations in the hands of the larger banks rather than in those of stockholders. In 1931, 57 percent of the assets of the 200 largest corporations were under the control of 166 persons, who held 298 directorships in the 43 leading companies.¹ The assets of these 43 corporations represented 13 percent of the national wealth. The same 166 persons also held 117 directorships in the 10 largest banks and 3 largest insurance companies. The 80 directors of the Chase National Bank alone were said to hold 287 directorships in 202 corporations whose assets in 1931 represented 29 percent of the corporate wealth of the country.

Cooperative Organizations.—The fourth type of business unit is the *cooperative association*, which is most significant in the field of marketing. In the United States, sellers' cooperation is more important than buyers' cooperation, while in Europe this distinction is less evident.

Sellers' cooperation is largely confined to agricultural products. There are three main types of such associations. One is the *local cooperative association*, operating in local markets and functioning, in general, as an individual business enterprise. Another is the *centralized cooperative association*, which differs from the local in that it covers a wide territory and ships from many local points. If local units exist, they are purely administrative, since authority is delegated to them only from the central office. California raisins are marketed in this way. Centralized associations usually aim to control a volume sufficiently large to enable them to exercise some influence on the price of the commodity.

The third type is the *federated cooperative association*, used mainly where locals were first in operation. Its purpose is similar to that of the strong central type, but authority moves in the reverse direction, *i.e.*, from the locals to the federation. The best known example is the California Fruit Growers' Exchange, a federation of about 200 locals, which is dominant in the marketing of citrus fruit grown in that state.

¹ STILLMAN, K. W., "Who Controls Business?" *The New Republic*, July 26, 1933, p. 280.

The essential idea of all cooperatives, however organized, is management in the interest of those who *do business with or through* the association, rather than in the interest of those who furnish the capital to conduct the enterprise. Thus the proceeds from the sale of goods, less selling expenses, are prorated back as *patronage dividends* to the farmers who furnished the goods. Members generally receive larger patronage dividends than non-members. If the association needs capital, it may borrow on the joint security of all members, it may sell stock to the members, or it may make deductions from returns to the members for business done, giving in place of the funds a receipt which later will be redeemed. If stock is issued, the dividend rate is *strictly limited*. *Democratic control* is assured, since each member may have but *one* vote regardless of the amount of stock he owns.

A further characteristic is the fact that cooperative associations are excluded from the scope of the anti-trust laws. Cooperatives may go so far as to make contracts with their members requiring the latter to sell all produce through the association. This measure generally is necessary to the continued success of the cooperative. One of the outstanding operating methods of cooperatives is the use of *pools*, similar produce from all members being placed in a single group or pool. Members are credited with the produce pooled; when the pool is sold, each member receives a share of the receipts, according to the proportion his produce bore to the entire pool. In the United States in 1936 there were some 6,500,000 farmers, of whom 3,300,000 belonged to 10,700 different cooperatives handling over \$1,530,000,000 worth of farm products each year. The fields in which these cooperatives were most important, in order of value of goods handled, were dairy products, grain, fruits and vegetables, livestock, and cotton products.

Importance of the Cooperative Movement.—Most nations have developed some form of cooperative movement, although its importance varies widely in different countries. In 1934 there were over 465,000 cooperative societies in 43 countries with a membership of about 140,000,000. Over 57 percent of the societies were in the field of agriculture, while 67 percent of the memberships were concentrated in consumers' cooperatives. The annual volume of trade in the 21 countries for which complete data are available amounted to \$12,400,000,000. The data in

Table 8 indicate the relative importance of the cooperative movement in several nations in so far as retail trade is concerned. The Soviet Union heads the list since the cooperative form of organization has been utilized there as an important link in the socialized marketing system. The backward position of the United States in this movement is evident. Cooperatives are

TABLE 8.—PROPORTION OF POPULATION AND OF RETAIL TRADE IN COOPERATIVES IN SELECTED COUNTRIES IN 1933*

Country	Percent of population in cooperatives	Percent of retail trade in cooperatives
Denmark.....	9	20
Finland.....	14	30
Great Britain.....	16	15
Soviet Union.....	44	66
Switzerland.....	10	15
United States.....	0 56	†

* *Monthly Labor Review*, U. S. Dept. of Labor, Vol. 42, No. 1, pp. 91-95.

† Too small to specify.

less important the world over in wholesaling and in production than in retailing. Nevertheless 46 wholesale cooperatives in 26 countries did an annual volume of business of \$8,250,000,000 in 1934, and 13 producing cooperatives in 10 countries had a volume of \$224,000,000.

Corporations, partnerships, proprietorships, and cooperative societies constitute the main types of organizations by means of which owners and managers direct and control business enterprises. These organizations, however, are only the framework for business activity. The activity itself might be that of marketing, finance, or production. These activities, therefore, are to be examined in the following chapters.

Problems

33. Mr. Adams owns and manages a small establishment which manufactures gaskets for gasoline motors. Do you think he should incorporate his business? Why? Is it to the interest of society as a whole that he do so? Why?

34. Streetcar rates are an important issue in the political campaign for mayor of city A. Mr. M, one of the candidates, says streetcar rates are too high because the streetcar company is overcapitalized. Mr. X, presi-

dent of the streetcar company, admits his company is overcapitalized but says the rates are high because of the highly overcapitalized condition of the companies from which rails, electrical equipment, coal, and supplies must be purchased.

a. Are the arguments presented by Mr. X sound? Why?

b. Answer the same question for Mr. M.

35. *a.* Why should a share of stock of \$100 par value sell for \$75? Explain carefully.

b. Would the company issuing this stock tend to be overcapitalized or undercapitalized? Why?

c. If a brick yard is undercapitalized, will it sell bricks at a lower price than otherwise? Why?

36. A real estate corporation is in need of \$200,000 with which to build two new apartments for rental purposes. Should the funds be secured by selling stock? Bonds? In some other way? Would your answer apply equally well to a company producing artificial gas? Why? To the New York Central Railroad? Why?

37. When is it advisable for a company to declare a stock dividend?

38. Under what conditions would no-par stock be better than stock having a par value, from the point of view of:

a. The stockholders?

b. The directors?

c. The investing public?

39. Mr. X is a member of a cooperative association which deals in groceries, fruits, and meats. Mr. Y owns 100 shares of common stock in a chain grocery store from which he buys his groceries, fruits, and meats. The former gets "refunds" from the cooperative, the latter "dividends" from the chain store. Wherein is their economic situation the same? Different?

References

BAKER, JOHN C., and DEANE W. MALOTT: "Introduction to Corporate Finance," McGraw-Hill Book Company, Inc., 1936.

BASSET, W. R.: "Operating Aspects of Industrial Mergers," Harper & Brothers, 1930.

BERLE, A. A., and G. C. MEANS: "The Modern Corporation and Private Property," The Macmillan Company, 1933.

DEWING, A. S.: "The Financial Policies of Corporations," rev. ed., Ronald Press Company, 1926.

HOAGLAND, HENRY: "Corporation Finance," rev. ed., McGraw-Hill Book Company, Inc., 1938.

LESSER, J. K., and J. A. GERARDI: "Federal Securities Act Procedure," McGraw-Hill Book Company, Inc., 1934.

MASSON, ROBERT L., and SAMUEL S. STRATTON: "Problems in Corporation Finance," McGraw-Hill Book Company, Inc., 1935.

QUINDRY, SILVESTER E.: "Bonds and Bondholders," Vols. 1 and 2. Burdette Smith Company, 1934.

Twentieth Century Fund, Inc.: "How Profitable Is Big Business?" 1937.

CHAPTER VI

DOMESTIC MARKETING

The organization for production, which has been described in preceding chapters, depends upon the effective operation of a marketing system. Obviously, what the producer cannot sell he would be foolish to manufacture. Indeed, the extent of the market for a commodity is the only foundation upon which a manufacturer safely may build production schedules. Marketing analysis therefore plays a very significant part in modern industrial technique.

Marketing involves two types of activity: (1) the physical movement of goods from producer to consumer, and (2) transfers of title to the goods. It is this second type in which we are interested. Any point at which changes in the ownership of goods are effected is called a *market* irrespective of the physical presence of the goods concerned. Middlemen may thus be classified into two groups: (1) *merchants*, who buy outright the goods they handle and thus necessarily take title to them, and (2) *functional middlemen*, who assist directly in effecting a change in ownership but do not themselves take title to the goods. Wholesalers, jobbers, and retailers are examples of the merchant class of middlemen, while functional middlemen are represented by brokers, commission houses, and selling agents. Railroads, banks, insurance companies, and warehousemen facilitate certain marketing activities by means of their specialized services, but they are not to be classed as middlemen since they render no direct assistance in the transfer of title.

Marketing Functions.—The orderly movement of goods from producer to consumer requires the performance of certain functions or services by someone. If the marketing functions are not performed by middlemen, they must be undertaken by producers or consumers. As Maynard, Weidler, and Beckman show in their "Principles of Marketing,"¹ these functions are:

¹ MAYNARD, H. H., W. C. WEIDLER, and T. N. BECKMAN, "Principles of

1. Demand creation (selling).
2. Purchase.
3. Transportation.
4. Storage.
5. Finance.
6. Risk assumption.
7. Standardization.
8. Collection of market information.

Demand creation is important because of competition, which requires each producer to attempt to divert business from his competitors, and because many consumers are unfamiliar with given products. Buying involves the determination of the sources of supply and of the kind, quality, and quantity of goods to be purchased; and includes the assembly of like or unlike goods from different producers. Transportation may be furnished by the merchant's own delivery equipment or by the various public utilities engaged in that business; storage likewise may be provided by the merchant or by a public warehouseman. Finance is significant because the majority of sales are made upon credit, which is advanced by merchants, manufacturers, or banks. Risk is an inescapable characteristic of business activity, but many risks may be covered by insurance; the non-insurable risks can be minimized only through the exercise of good business judgment. Standardization is necessary in order that goods may be graded; it is only then that sales may be based upon *description* or *sample* instead of upon *inspection* of each unit of the goods. Market information is absolutely essential if the producer is to make the most of his opportunities, and many functional middlemen owe their existence largely to skill in obtaining and analyzing information respecting possible markets.

Classes of Goods.—Some articles require very little processing before consumption; other classes of goods must be treated extensively before they can be consumed; and some commodities are produced, not for personal consumption at all, but to aid in the manufacture of consumption goods. The following classification of goods is significant because the problems involved and the distributive channels used in marketing the various classes are more or less distinct.

Marketing," rev. ed., Ronald Press Company, 1938; "Recent Economic Changes," McGraw-Hill Book Company, Inc., 1929, and BERNARD LESTER, "Marketing Industrial Equipment," McGraw-Hill Book Company, Inc., 1935, have been drawn upon for some of the material in this chapter.

- I. Products of the extractive industries.
- II. Manufactured goods.
 - A. Producers' goods.
 - 1. Semi-manufactured goods.
 - 2. Equipment.
 - 3. Supplies.
 - B. Consumers' goods.
 - 1. Convenience goods.
 - 2. Shopping goods.
 - 3. Specialties.

Products of the Extractive Industries.—The chief extractive industry is agriculture, which provides both raw materials and finished consumers' goods. Many of the raw-material markets are highly organized and provide for trading in both cash and futures contracts. Some consumption goods are sold direct to retailers or consumers, but farm products generally are handled in one or more of four different markets: (1) the local grower's market, (2) city wholesale markets, (3) jobbing markets, and (4) the retail market.

The products of the other extractive industries, such as mining, forestry, and fisheries, tend to pass through fewer hands than do agricultural products. This difference is largely due to the much greater number of small producers in the latter field. A marked distinction between the raw materials of the extractive industries as a whole and the products of manufacture is the fact that the commodities of the former group cannot be distinguished by brands or trade-marks. Purchase therefore tends to be by specification on the basis of a highly competitive price.

Producers' Goods.—Commodities which are desired not because they yield personal satisfaction in consumption but because they assist in the production of consumers' goods are called producers' goods. In this group we may distinguish *semi-manufactured goods*, which require further processing before they become ready for final use, as pig iron or cotton yarn, or assembly parts, as electric motors for washing machines; *equipment*, such as basic machinery, trucks, tools, or steel shelving; and *supplies*, which are themselves finished goods but are used in production—examples would be lubricants, light bulbs, belting, and general office supplies. Some producers' goods are sold through wholesalers and other middlemen, but a large quantity are handled by direct sale. Since many of these commodities are highly

specialized machines and appliances, considerable technical skill is required in their sale, installation, and maintenance. For this reason an increasing number of engineers upon graduation from engineering schools secure positions as technical salesmen of producers' goods. Thus it seems advisable to examine this aspect of marketing in some detail.

Characteristics of Machinery and Equipment Marketing.—The marketing of machinery and equipment evidences several characteristics which are distinct from those to be found in the sale of consumption goods. Thus the appeal to the purchaser must be a financial one. Successful selling methods must view the product from the customer's angle. He is faced with a technical problem: How can this job be done? or with a financial problem: How can the job be done more cheaply? The technical salesman therefore needs to know thoroughly the mechanical characteristics and the economic possibilities of the product and should take care to show the customer how the product can do the job better or cheaper than its competitors. In order to solve the customer's problem, the salesman should know in detail the customer's production processes so that he may fit his product into them to the best advantage.

In many cases the salesman of producers' goods has a double duty to perform. First he must sell the *need* for his class of product to the customer; then he must sell *his* particular product itself. Thus it may be necessary to demonstrate the need for conveyor equipment of any sort before the salesman can attempt to sell his own company's conveyor appliances. Since many producers' goods are highly technical, the seller often must be in a position to install his products himself and to adjust them correctly to the operating conditions of the customer's plant. This work may be done under the supervision of the salesman or by a special staff from the home office.

The successful salesman must study the buying policies of his customers. He may be selling to corporations, but individual persons will be the ones to decide whether or not to buy. Supplies may be obtained largely through a purchasing agent, but the larger and less frequent purchases of machinery and equipment may require the approval of three to six officials in each company. The salesman must see that each of these responsible persons has been "sold" on his product. The salesman will find also that the

items involving large expenditures may require a period of negotiation and salesmanship four or five times as long as that for inexpensive items.

Machinery and Equipment Outlets.—When producers' goods are distributed in some fashion other than by direct sale from producer to customer, a number of possibilities are available. They are summarized in Bernard Lester's "Marketing Industrial Equipment"¹ in these words:

The kinds of resale outlets that commonly exist in this country and are employed by machinery and equipment manufacturers are as follows:

- A. Machinery and equipment dealers, who to a greater or lesser extent operate as agents for the manufacturer in a restricted territory or with a restricted class of customers.
- B. Other machinery builders, who include the manufacturer's products as an integral part of the completed apparatus, or who sell the products along with their apparatus because it forms an element in the operation of the completed installation.
- C. Contractors of various sorts who, in completing an installation contract for an ultimate purchaser, supply machinery and equipment as a part of [the contract].

In addition to the foregoing we have the architect and consulting engineer, who usually do not purchase anything, unless specifically employed to do so for an individual project. They have, however, a profound influence upon what the ultimate customer may purchase.

The wholesaler or jobber forms another resale outlet; but this class operates mostly in the field of very small and light machinery, equipment, and supplies.

In some lines of business certain items of machinery are installed on a *lease* basis, rather than sold outright. Under this plan the use of the machinery involves either a flat monthly rental or a flat price per unit processed by the machine. In the latter case a counting device is attached to the machine. The lease plan has been used successfully to equip shoe factories and shoe repair shops with the necessary machinery; to supply road contractors and building contractors with equipment which would be too costly for the individual contractor to purchase; and to supply offices with electrical tabulating, sorting, and accounting machinery.

¹ McGraw-Hill Book Company, Inc., 1935, p. 141.

Any manufacturer of producers' goods should take numerous factors into consideration when he selects the outlets he is to use. The basic idea is to make it easy for the user to acquire the product and to receive adequate service which will keep it in operating condition. Generally speaking, large, costly, complicated, and technical products are sold direct by the manufacturer to the customer. Other products may be distributed in other ways, depending on the number and geographical distribution of the customers and on the buying habits which they may have formed in past years.

The manufacturer also should survey his market from time to time to see that his energies are properly directed. He may conduct a *product analysis* to see if his product is designed to be most useful to the customer and if he is using the distribution methods most satisfactory to the user. A *market analysis* may be undertaken to ascertain the location, extent, volume, and character of the market for a product. Thus the producer may learn, for example, if he is obtaining complete market coverage for his product. Due to the constantly changing size and technique of business, an *industry analysis* should be conducted periodically. The introduction of cellophane, for example, has called for new kinds of machinery, particularly for package formation. If some machinery producers do not keep up to date, they will be outdistanced by their competitors. *Competitive analysis* of the products, market coverage, and distributing methods of other producers allows the manufacturer to meet or avoid competition and may be used to improve competitive conditions as a whole.

Advertising Producers' Goods.—Advertising has a real function to perform in the sale of producers' goods, although this function is not the direct operation of selling. The actual sale usually must be made through the personal contact of the technical salesman. Advertising may announce quickly and economically to the market the availability of a new product or service or a new use for an old one. Advertising may state accurately and clearly the product's qualities in the language of the customer. It may convince the customer that the advertised product will save him money. Advertising may establish confidence and trust in the manufacturer's ability to serve his customers satisfactorily. Advertising must be clear-cut, forceful,

truthful, and eminently respectable if it is to perform its function in this field. Finally, we must note that advertising should do just what a good salesman would do if he were able to speak to many customers at once. Thus we may conclude that advertising and personal salesmanship must go hand in hand. Each will be used to support the other in any well-rounded sales program.

Financing Producers' Goods.—Most sales of producers' goods are made in accordance with terms of payment which are established by the seller and which apply to the particular product, or even the particular transaction, involved. These terms are seldom based upon a recognized plan of finance such as has been developed for installment purchase of consumption goods. Where the purchase assures definite savings, however, payments sometimes are arranged as installments to be covered by the savings obtained. This procedure also is applied to some purchases by municipalities so that bond issues are avoided and payments are based upon periodic tax returns. In other cases where the seller must be granted deferred payments, it is customary to provide them by means of a series of interest-bearing notes with various maturity dates. The seller may retain these notes until they mature, he may discount them at his bank, or he may sell them to a finance company which specializes in handling such paper. A number of manufacturers suffer heavy losses or even failure because they are uninformed upon the problem of credits and collections. This problem, however, is one which concerns the financial officials of the company, and they should be instrumental in assisting the sales department to reach a satisfactory credit policy.

Consumers' Goods.—Commodities which are to yield utility to the final consumers as they use the articles are consumers' goods and may be divided into three classes. *Convenience goods* are those articles in the purchase of which the consumer will put forth only a minimum of effort, since they usually involve a small unit price. Tobacco, drugs, some hardware, and staple groceries are examples. The articles must be readily accessible since prompt satisfaction of a clearly defined want is required; thus wholesalers are generally used to distribute the goods to retailers. Unlike the purchaser of convenience goods, the shopper's concept of what to buy, and where to buy it, is not clearly defined when the shopping expedition is begun. Thus for such

shopping goods as clothing, jewelry, or furniture, the consumer expects to compare prices, qualities, and styles before deciding upon the actual purchase. Department and specialty stores carry such goods and tend to locate close to each other in order to facilitate the shopping procedure. Some clothing and many household mechanical devices, called *specialty goods*, have some particular attraction for the consumer other than price, which induces him to put forth special efforts to visit the stores that handle them. Direct sale from the manufacturer to the retail trade is common in this field, as is the use of the exclusive agency plan.

Types of Retail Outlets.—Consumption goods are made available to the general public through a number of different types of retail outlets. The choice of the particular type of outlet to be used by a manufacturer depends largely upon the nature of the goods themselves. The *general store* developed from the frontier trading post and is found today in rural districts, small towns, and outlying suburbs of larger cities. It handles a large number of different lines of merchandise and usually buys from wholesalers. A *unit store* is owned and operated as an independent unit and handles a limited line of merchandise. Unit stores handle convenience or specialty goods and buy from wholesalers.

A *department store* is a retail institution organized on a departmental basis, in which one of the major departments is dry goods. A few such stores have over 100 departments and may have net sales of as much as 50 million dollars annually. They do about 9 percent of the total retail business and handle all classes of goods, though shopping goods are the most important group. Department stores buy from wholesalers or direct from manufacturers. The term *mail order house* refers to stores that secure and deliver their orders by mail. They may be subdivided into: (1) general mail order houses, as Sears, Roebuck and Co., (2) specialty mail order houses, as the National Bellas Hess Company, (3) manufacturers who sell direct to consumers by mail, and (4) department stores accepting some orders by mail. Local mail order house branches for direct retail trade have appeared as a result of competition due to the development of good roads and automobiles. Many mail order houses purchase direct from producers or operate their own manufacturing plants.

A *chain store* system is a group of stores handling similar lines of merchandise with a single ownership and centralized management

but with decentralized location. There are over 10,000 chain store systems in the United States with a combined total of over 100,000 retail outlets, doing an annual volume of business representing about a fifth of the total retail trade. They are strongest in the fields of groceries, drugs, and shoes. At the present time, some shifting is taking place from convenience goods to shopping and specialty goods. The chain store idea is being extended into the department store field. Sources of supply for chain stores are similar to those for mail order houses.

The One-price Policy.—Retail trade in the United States is conducted largely on the basis of the *one-price policy*, which requires that the same price be charged to all customers who purchase goods under substantially similar conditions as regards place and time of purchase, terms of credit, quality, and quantity. These conditions do not prevent the frequent changing of prices, however, so long as the new prices are the same for all customers.

The *varying-price policy*, on the other hand, is still used to a considerable extent in wholesale trade and applies to a few commodities in retail trade. This policy permits price concessions to favored customers because of competition and the customer's superior bargaining ability. Such concessions take the form of lower quotations, extra cash discounts, extra trade discounts, or exceptionally high quantity discounts.

Trade Discounts.—In a large number of lines it is customary for manufacturers, wholesalers, and other vendors to quote prices to their customers, known as *list prices*, from which one or more discounts are to be deducted before the actual selling price is determined. An illustration of a list price with a string of discounts is as follows: \$10 — 50 percent — 10 percent — 20 percent — 3 percent. The price that the customer pays for the article is \$10 less 50 percent, leaving \$5; less 10 percent of \$5, leaving \$4.50; less 20 percent of \$4.50, leaving \$3.60; less 3 percent of \$3.60, or \$3.49.

One reason for the use of such a system is the practice of issuing comprehensive and costly catalogues at infrequent intervals. Changes in selling prices may then be arranged through the issue of new discount sheets to apply on the list prices given in the catalogue, instead of requiring the publication of an entirely new catalogue. The use of a varying-price policy is an important reason for the use of list prices, as indicated above, since the dis-

count sheets may be retained by the salesman. He is thus in a position secretly to quote different prices to his various customers as the situation requires.

Price Guaranties.—Many manufacturers, particularly producers of goods sold by wholesalers and retailers on a seasonal basis, guarantee their prices against decline so that they may secure orders sufficiently in advance of production to allow for continuous operation of the plant. Such a guaranty usually involves a contract to make a rebate to the wholesaler, in the event that the manufacturer reduces his own prices prior to a certain specified date, and applies only to that portion of the stock which the wholesaler has on hand unsold. Thus guaranties against price declines are in reality manufacturers' guaranties of dealers' profit margins.

Resale Price Maintenance.—Resale price maintenance involves the attempt at determination by the manufacturer of the price at which an article identified by a trade-mark or brand should be resold by a purchaser, or subpurchaser, to the ultimate consumer. The policy chiefly affects convenience and specialty goods. Its purpose is to prevent retail price cutting on standard brands of nationally distributed merchandise. In 1936 Congress passed the Miller-Tydings Act, which amended the Sherman Anti-Trust Act, so that agreements fixing the minimum price of goods in interstate commerce became legal. Such agreements, however, must be between a producer and a distributor; they cannot be made by a group of producers, wholesalers, or retailers, as the latter type of agreement is held to be in "restraint of trade."

Practically all states now have resale price maintenance laws, which enable a manufacturer to contract with dealers to establish a minimum price for his goods. These laws require that the goods must be branded and readily identifiable. Most state laws make no specific provision for enforcement, leaving that matter to interested groups and to the courts. Merchants in the vicinity of the price cutter usually complain to the state Fair Trade Committee (usually a voluntary group with no legal status), which investigates and warns the offender. If the offender persists, the Fair Trade Committee may seek an injunction, or any person, retailer, wholesaler, or manufacturer who can show damage may institute civil action against the price cutter.

Robinson-Patman Act.—The federal “Fair Trade Practice” Act is designed to prevent unfair competition by making it unlawful for sellers: (1) to discriminate in price between different buyers of goods of like grade and quality unless such price differentials make only due allowance for differences in cost; (2) to make any payment to a customer in consideration of any service, unless such payment is available on proportionally equal terms to all other customers; and (3) to grant any commission or brokerage fee to buyers, either directly or indirectly.

The first provision deals largely with quantity discounts, permitting them only where they are not discriminatory. The second provision, relating to advertising allowances, permits such allowances only on equal terms to all buyers. The last provision prohibits the granting of brokerage fees to any broker controlled by the buyer or to any broker who passes on these fees to the buyer. Enforcement of the act is in the hands of the Federal Trade Commission. If anyone feels he has been a victim of discrimination he may enter a complaint, whereupon a hearing is granted. If proof of such discrimination can be furnished, it is the obligation of the accused to justify his position or to cease his questionable practices.

Brand Policies.—The possibility of stimulating demand varies with different articles. Brands constitute one of the important methods of creating and controlling consumer demand, since they help the consumer to identify the article that he is buying and therefore play a very important part in repeat sales. Some consumers buy branded goods as a matter of policy, for branded articles enjoy a certain amount of prestige in the minds of many persons.

Every wholesaler is confronted with two problems in regard to brands. The first involves a decision as to whether he shall handle principally branded or unbranded goods. The second relates to the adoption of his own brands, called *private brands*. In some trades few jobbers will be found who do not attach their own labels to at least part of the merchandise they sell. Manufacturers consider that private branding on the part of wholesalers places these middlemen in direct competition with the producers of the goods. As a result, they sometimes attempt to go around the wholesaler and try to sell direct to retailers or consumers. On the other hand, many wholesalers fear that, when

they have built up a strong demand for a manufacturer's well-advertised brand, the producer will sell direct to the retail trade. In this event, the wholesaler would be deprived of any opportunity to realize a profit on his demand-creation activities.

The agitation on the part of certain consumer groups for grade labeling of merchandise is probably a product of the depression. It is argued that there is too much duplication in brands of goods, which duplication could be reduced by "descriptive" labeling or "grade" labeling. Descriptive labeling means that the label would carry terms descriptive of the significant characteristics of the product, such as size, variety, and so on. Grade labeling implies specifications of quality which would be designated on the label by a letter or a number.

The Cost of Marketing.—The cost of marketing, depending on the line of merchandise considered, accounts for anywhere from one-third to over one-half of the consumer's dollar. Wholesaling operations are not so costly as retailing, because the quantities handled are larger. Thus packaging costs are less, rent is a smaller percentage of sales, fixtures and other equipment items are less costly, and wholesalers have not been forced to give so many kinds of services as have retailers. Wholesalers' total expense ranges from 8 to 15 percent of net sales, while their net profits range from 1 to 3 percent of net sales. Retailers' total expense, however, ranges from 20 to 35 percent of net sales, although net profits show, on the average, about the same relation to net sales as do the profits of the wholesalers.

Marketing Efficiency.—Criticisms of the efficiency of our present-day marketing system are leveled at the heads of both middlemen and consumers. Marketing costs, it is often said, are too high because there are too many middlemen. An excessive number of middlemen may mean that there are too many different kinds of middlemen handling a given product in turn, in its passage from producer to consumer. This is really a problem of the degree to which specialization can be carried profitably. The various marketing functions must be performed by someone. If there is a sufficient volume of goods to permit a high degree of specialization, an increase in the number of successive middlemen already in existence may, and sometimes actually does, result in lowering the costs of marketing through increased efficiency. On the other hand, to say that there are too many middlemen may

mean there are too many persons attempting to render the same service and to operate in exactly the same field in a similar capacity. Recent developments on the part of independent grocers, for example, seem to show that there are at times too many middlemen in the grocery field. The presence of an excessive number of competing middlemen is, perhaps, more true of retailing than of wholesaling.

The other attack upon the efficiency of our marketing system is based upon a charge of gross inefficiency in buying on the part of consumers. This problem, which will be discussed at some length in Chap. XII, need not be considered here.

Problems

40. "What is to be produced depends directly upon what consumers want to buy." "Our advertising department has been very successful in creating a demand for our products." Can both statements be true at the same time? Why?

41. If you had money enough to buy an automobile and wished to spend it for that purpose, would you refrain from buying a car because you could not see a motorcar advertisement? Why? Does it follow, then, that the money spent in advertising automobiles is wasted? Why?

42. If your company is engaged in producing mining machinery and equipment, how would you expect it to be marketed? Why?

43. "Once an article is produced, it is necessary only to get it into the hands of its ultimate users. The factory can hold the articles until they are ordered by phone, mail, or wire, when they can be delivered anywhere c.o.d. by mail, express, or freight. Therefore there is no need for wholesale houses or retail stores." Do you agree? Why?

44. "A stable price level is universally desired. In order to attain it, each producer need only set a price on his product and insist that the retailer sell only at that price. In this way price variations would at once disappear and the price level would be stabilized." Discuss.

45. Would you classify a radio set as a convenience, shopping, or specialty good? Why? Through what retail outlets should it be offered to consumers? Why?

46. How would you proceed to analyze the probable market for a new type of electric razor?

47. An automobile manufacturer is considering the advisability of leasing automobiles at so much per month rather than selling them. What advantages and disadvantages might the users of automobiles encounter in such a plan? The producers of automobiles?

References

BECKMAN, T. N.: "Credits and Collections in Theory and Practice," rev. ed., McGraw-Hill Book Company, Inc., 1938.

———: "Wholesaling," rev. ed., Ronald Press Company, 1937.

BECKMAN, T. N., and H. C. NOLEN: "The Chain Store Problem," McGraw-Hill Book Company, Inc., 1938.

Federal Trade Commission: "Prices and Margins of Chain and Independent Distributors," U. S. Superintendent of Documents, 1933.

LESTER, BERNARD: "Marketing Industrial Equipment," McGraw-Hill Book Company, Inc., 1935.

LEWIS, HOWARD T.: "Problems in Industrial Purchasing," McGraw-Hill Book Company, Inc., 1935.

MAYNARD, H. H., W. C. WEIDLER, and T. N. BECKMAN: "Principles of Marketing," rev. ed., Ronald Press Company, 1938.

PYLE, J. F.: "Marketing Principles," McGraw-Hill Book Company, Inc., 1936.

CHAPTER VII

MONEY AND MONEY SYSTEMS

I. THE PLACE OF MONEY IN ECONOMIC LIFE

The large-scale production and division of labor described in preceding chapters could not long continue if there were no means for exchanging goods and services. To facilitate this exchange it has been necessary to develop warehouses, markets and stores, highways, railways and ship lines, money systems, banks and credit facilities, business rules, regulations and laws, and other devices and institutions which are meshed together in the modern business community. The connecting link between producers and consumers, buyers and sellers, workers and employers, businessmen and farmers, is the common denominator in which the value of their contributions, their wealth, their incomes, and all their financial dealings are expressed. This common denominator is *money*, and includes everything which is generally accepted in a community in exchange for wealth, property, and services.

Importance of Money.—Money is necessary to buy clothes, food, medical care, transportation, recreation, and security. It makes little difference whether one earns a living by mending shoes or by making laws, by growing potatoes, building houses, or designing motors, one must obtain and spend money. The money itself is of small importance, however. One could starve surrounded by millions of dollar bills. We work to obtain money only because it possesses the power to command other things in exchange. When it ceases to do that, we no longer desire it; in fact, we attempt to rid ourselves of it as quickly as possible.

Money in the United States.—At the beginning of 1938 the United States Treasury reported a total of \$6,334,000,000 of currency in circulation.¹ At the same time the stock of monetary

¹ *Federal Reserve Bulletin*, April, 1938, p. 297. The term "in circulation" does not mean that the money is actually in use, but only that it has been emitted. Hoarded money is counted as currency in circulation.

gold was valued at \$12,756,000,000.¹ The gold itself was not in circulation, but was held in safekeeping as "reserves" for currency and bank deposits. Bank deposits of the "demand" type make possible the use of checks, which are sometimes referred to as "deposit currency." In February, 1938, member banks in the Federal Reserve System reported gross demand deposits of \$28,626,000,000² upon the basis of which is written most of the huge volume of checks which effect over 90 percent of the financial transactions in the United States today.

In considering the problems of money and credit, the student should keep in mind the dominating position of bank deposits and bank checks. In this and the following chapter we shall be concerned with the development of monetary systems from those in which metallic money was the chief means of payment to the modern system, in which most of the payments are made by means of bank checks. We shall be concerned also with the operation of the United States monetary system, and with some of the economic problems to which it gives rise.

Origin of Money.—A number of different explanations have been advanced for the origin of money. Most of these attribute it to some phase of trading, either between different tribes or within one tribe. Thus the great Scottish economist, Adam Smith, believed that the object (or commodity) used as money was at first a necessary thing for living, such as fish hooks or skins. These articles originally were valuable in themselves, he thought, but eventually lost their original use and became merely a *medium* of exchange. Another economist, John Stuart Mill, believed that primitive societies shared necessities in common. Money was a luxury article, however, whose possession conferred standing and prestige on the owner. Having this prestige value, it could always be exchanged for necessities if the need arose. We have no way of knowing which of these explanations is correct. Different tribes probably developed money for different reasons. The chances are, however, that in no place did money develop as the result of a conscious effort to eliminate the difficulties of barter. It is more likely that trading was at first confined to a few articles and that one of these came to dominate the rest for one reason or another.

¹ *Ibid.*, p. 298.

² *Ibid.*, p. 296.

Evolution of Money.—The commodity used as money has changed with the type of economy. In the hunting and fishing economy, shells, such as the wampum of the American Indian, trinkets, and skins were used as money; in the pastoral economy, cattle or sheep were used; in the agricultural economy, grain (usually wheat) was used, although the early American colonists used tobacco for a time. With the development of commerce, metallic money was introduced. As economic and social organization became more complex, metallic money was standardized and made uniform, chiefly by bringing its issuance under the regulation of government mints. Paper money was soon introduced as a substitute for coins, and its use spread with the rise of banking. With the development of banking also came the most modern form of money, the bank check.

From this brief summary of the origin of money and its evolution, we see that money has three distinct features: (1) It has general acceptability; (2) often it has value apart from its use as money; and (3) it changes with the type of culture in which it is used.

Functions of Money.—In modern society, money performs a number of functions. When it performs these functions efficiently and smoothly, the composition and operation of the money system are given little attention by the average person. It is only when money fails to perform efficiently one or more of its functions that we become concerned about it and desire to change it. Before we can understand the operation of the money and credit system, and its problems, we must know what functions it performs in modern economic society.

Possession of the features of general acceptability and intrinsic value enables the commodity which is used as money to serve as a *medium of exchange*. Thus the engineer can exchange his technical services for a certain quantity of money and with this medium of exchange he can purchase the commodities and services which he desires.

In order that some one commodity may serve as a medium of exchange, there must be some convenient way of measuring the relative values of the commodities and services which are exchanged for that particular commodity. Hence the commodity gold has served as a *standard of value* because all other articles and services may be evaluated in terms of it. Thus a

bushel of wheat is said to be worth \$1, a quart of milk 10 cents, and so on.

One of the characteristics of an advanced industrial economy is production for future use. This method of production has been made possible largely because people have been able to predict the future with some degree of accuracy. An important problem in any society is that of providing for the future. In modern society this problem is met largely by means of investment. In more primitive societies it was done by accumulating tangible property. Money in the form of metallic coin was especially desirable because its value was fairly constant and it could be stored for future use, thus serving as a *store of value*. The problem of security with regard to the future behavior of money is intimately connected with the use of credit. This aspect of money will be considered more fully in Chap. VIII.

The operation of the modern economic system is dependent to a very large extent upon bookkeeping and other records of all kinds. Deposits in the bank, capital invested in the business, accounts payable and receivable, accrued wages and other cost items, and inventories on hand represent a few of the significant data required in the conduct of business. All these items are recorded in terms of the money unit. Thus the fourth function of money is to serve as a *standard of account*. In the absence of a money system the complicated business records—and possibly the business system itself—could not be kept in operation. As modern accounting procedure and engineering techniques continue to replace rule-of-thumb methods, the standard of account becomes an increasingly vital part of the industrial system.

II. ESSENTIALS OF A MONEY SYSTEM

An efficient money system is one in which the functions of money are performed with a minimum of friction to, and disturbance of, the economic system. Among other things, the economist is interested in money systems in somewhat the same way that the physical scientist is interested in a system of weights and measures. If an engineer in Chicago orders 1,000 feet of 2-inch copper tubing from New York, he expects that the firm in New York will use the same system of weights and measures that he uses. If he were ordering the tubing from a firm in France, he

would expect a definite relationship to exist between the metric system used there and the English system, *i.e.*, that his order for 1,000 feet of 2-inch tubing could be converted into an equivalent order in terms of meters and millimeters.

A money system provides a means of measurement for the economist. It differs from that used by the physical scientist, however, in that it is not standardized in the same way. Thus, referring to the example above, the engineer expects that the length of tubing which the New York firm measures off as 1,000 feet will differ from his own measurement by only a very small fraction. In the case of money, a dollar may purchase more goods at one place than at another, or at one time as compared with another. No money system has yet been devised in which a given amount of money, \$10, for example, will buy as much of goods and services *in general* at one time as at any other time. While economists do not agree that the purchasing power of money should be made inflexible, even if such a thing were possible, they do agree that money should be standardized in the sense that the various types of money within one country should bear a constant value relationship to one another at all times and at all places; and that the purchasing power of money should not be subject to rapid or extreme fluctuations. Of these two problems, the latter is much more difficult of solution and is the central problem in any money system.

Legal Tender.—To say that a money is legal tender means that if a debtor presents it in payment of a debt, and the creditor refuses to accept it, the latter may no longer charge interest on the debt. In a country in which there are several kinds of money, and all are legal tender, the conversion of one type into another at par tends to be maintained because each kind can be used in settlement of debts. As will be shown in the next section, however, it has not always been true that all kinds of money enjoyed the same right of legal tender. At the present time “all coins and currencies of the United States” are full legal tender for all debts, public and private.

Parity, Security, and Redemption.—In practice the problem of maintaining the various types of money at par often has been one of keeping the metallic coins from having a higher value as bullion than as coin. There have been a number of instances in the United States in which this disparity of values appeared.

In 1853 the quantity of silver in the subsidiary coins (dimes, quarters, half-dollars) was reduced because the old coins could be melted down and the silver sold as bullion for more than the face value of the coin. If the quantity of silver had not been reduced, all the subsidiary coins might have disappeared from circulation. During the Civil War gold coins went to a premium because of the excessive issue of "greenbacks." To keep paper money and coins at par, it is necessary that the paper money be readily convertible into metallic money, or that the public be confident either that it will be redeemed by the government or that its amount is not excessive. The fact that gold went to a premium after the issuance of the greenbacks is generally attributed to the lack of public confidence in the ability of the government to redeem its notes.

The Problem of the Money Standard.—Even though the various types and denominations of money are readily convertible one into another, there is nothing to prevent the money unit—the dollar in the case of the United States—from constantly changing in value. This fluctuation in turn automatically changes all the other denominations in the same proportion. What prevents a dollar, for example, from buying ten sandwiches today and only one tomorrow? Why does it not require a million dollars to purchase a sandwich? The answers to these questions are to be found in part in the money standard: *that which fixes the value of the money unit*. Given a certain kind of standard, it would require a million dollars to buy a sandwich; given another type of standard, one dollar would buy a million sandwiches. Such absurdities have actually occurred, not only in one country at different times but in many countries. To prevent just such things from happening, those responsible for money systems have sought without complete success to find a standard of unchanging value. In the search for it, a number of different standards have been tried and many more have been suggested.

Qualities of a Standard Money.—Since one purpose of a standard money is to minimize fluctuations in prices, the commodity which is to serve as the standard money must itself be as stable in value as possible. No commodity has yet been discovered which is absolutely stable in value, but the precious metals, particularly gold, have won the most favor. Gold and silver are extremely durable, and consequently fluctuate *relatively*

little in value because the amount added each year by new production is only a small percentage of the total amount in existence. In addition to this quality of durability, the precious metals possess other qualities which make them peculiarly suited for circulating money. Gold especially is very valuable in itself, apart from its use as money. It has been prized for centuries and is a universal symbol for high value and quality. Gold also has high value in relation to its bulk so that a small amount can be carried and used for rather large transactions. Gold and silver will not rust or deteriorate with age; they can be divided and subdivided; and they are homogeneous, *i.e.*, one piece of either metal may be made like any other piece. Because of these attributes, gold and silver have long been used as money.

The Development of Paper Money.—With the development of commercial and industrial activity, however, it became inconvenient to use gold and silver for all payments. To meet this difficulty, gold was stored in certain places and the receipts given to the owner were assigned in settlement of accounts. This method, too, was inconvenient because the receipts were for the amount of the gold deposited and did not always correspond to the amount of the debt which the owner wished to discharge. To overcome this difficulty, the receipts were printed in certain standard amounts. Out of this practice grew the modern bank note. The goldsmiths who stored the gold for their clients soon discovered that not all the receipts were presented on the same day and that the new owners frequently left the gold with the same goldsmith. The next step was to issue receipts in excess of the amount of gold on deposit. So long as no more receipts were presented at one time than could be met with the amount of gold on hand, and so long as about the same amount of gold was redeposited as was drawn out, this practice of issuing additional notes could be continued. Out of this practice grew modern commercial banking. The use of checks in reality permits the depositor to make out a “bank note” for a certain amount and to give it to someone else in exchange for goods or in payment of a debt. The check differs from the conventional bank note chiefly in that it has limited acceptability.

Problems Created by the Use of Bank Notes and Bank Checks. The development of bank notes and bank checks introduced new

problems. Too many bank notes might be issued or too many deposits granted so that banks failed because they could not meet the demands for cash. It was necessary, therefore, to provide some means for regulating the volume of bank notes and bank checks to prevent overissue and to prevent excessive fluctuations in the value of money. One of the chief reasons for the adoption of gold and silver as money was their relative stability in value. This stability in turn was a result of their durability and slow increase in amount from year to year. With the growth of bank notes and bank checks, however, the quantity of money could be increased or decreased quite rapidly. To regulate the quantity of these new forms of money, it was decided to connect their amount in some way with the amount of one or more of the precious metals. This connection resulted in what we now call a "metallic money standard."

The Gold Standard.—When a country is on the gold standard, its monetary unit is defined as a particular quantity of gold of a stated purity, and other types of money bear a certain quantitative relationship to the amount of gold which the country has at any one time. This relationship usually takes the form of specified gold reserves for the paper money, but not necessarily for bank deposits. The United States requires a minimum reserve for deposits in the Federal reserve banks, but this reserve need not be in the form of gold, though in practice most of it is in gold certificates. Since these deposits serve as reserves for most of the commercial banks in the country, the effect is to limit bank deposits to a certain multiple of the gold stock. The operation of this requirement will be taken up in greater detail in the following chapter.

Most of the important countries of western Europe had adopted the gold standard by about 1870, and the United States followed officially in 1900. With minor exceptions the gold standard operated in western Europe and the United States until the World War, when all the nations, with the exception of the United States, were forced to abandon it. Prior to the World War, the following conditions were considered necessary for the existence of a gold standard:

1. There must be a legal gold unit (such as the dollar or pound).
2. There must be no limit to the quantity of this unit which will be coined (free coinage), and it is advisable to have coinage without charge (gratuitous coinage).

3. There must be unlimited redemption of other monies in gold, and there should be no restrictions upon the melting of gold coins. Points 2 and 3 taken together result in the value of gold as coins being always equal to the value of the same amount of gold as bullion.

4. Gold money must be full legal tender.

5. There should be adequate gold reserves for paper money and for bank deposits.

6. There should be free international movement of gold.

In order that these technical conditions could be fulfilled, it was necessary that certain fundamental customs and institutions regarding the use of gold should dominate economic life. Some of these fundamental conditions were:

1. There should be a well-established and widely held custom of using gold.

2. There should be a settled habit of judging values in terms of a system of prices based on gold.

3. The banking system, credits, and contracts should be on a gold price basis.

4. There should be laws and court decisions to uphold a gold basis.

5. There should be a strong public opinion favoring the gold standard and a strong government to enforce the law.

With the World War and its consequent economic maladjustments, most of these fundamental customs and institutions regarding the place of gold in the economic system underwent rather drastic revision. Thus a radical reorganization of economic thinking has been necessitated with regard to monetary systems. Before discussing the new monetary systems which have emerged since the World War, however, we must consider another monetary system that has been widely used in the past and that is still advocated by some people.

The Bimetallic Standard.—Since the value of gold varies from time to time, the gold standard is not always completely satisfactory. Should we do better to have a double or “bimetallic” standard somewhat on the principle of the balance wheel in a watch? Such a balance wheel is composed of two metals the rates of expansion of which are different. When heated, the tendency of the balance wheel to enlarge is counteracted by these unequal rates of expansion so that the wheel’s diameter is constant and the watch continues to keep correct time. If both gold and silver were to be standard monies, would value changes in one be counteracted by changes in the other so that the bimetal-

lic standard would be more desirable than our present single standard? Abundant experience has shown bimetallism to be unsatisfactory, unless perhaps accepted on a world-wide basis, since a number of nations, including the United States, have tried it unsuccessfully within the last 150 years.

A bimetallic standard is composed of (1) two metals, both of which (2) are full legal tender, (3) are freely coined, and (4) have a fixed (or mint) ratio one to the other, on the basis of the weight of pure metal each contains. The mint ratio must represent accurately the relative values (market ratio) of the two metals. If their values were stable this relation would be easy of accomplishment, but the two-standard balance wheel would not then be necessary. Actually, the market ratio is constantly changing because price-determining factors are not the same for both metals. Thus one metal becomes overvalued at the mint or undervalued in the market. This metal would therefore be taken from the market to the mint for coinage, while the other metal, oppositely affected, would flow into the market where its value is greater. The "cheap" money, in other words, will drive the "dear" money out of circulation (Gresham's law). The bimetallic standard, therefore, would be replaced by a single standard of silver or gold, as the case might be.

Most individuals believe that bimetallism as an issue died with Bryan's defeat in the "free silver" presidential campaign of 1896. This is not entirely true, however. As a matter of fact, as will be shown in another section, the existing United States law provides for a form of bimetallism if the President should use the discretionary power granted by Congress in 1934.

Symmetallism.—It is occasionally proposed that the difficulties of bimetallism could be overcome by putting both gold and silver in the same coin. If this were done, coins would be taken out of circulation only if the combined bullion value of the gold and silver contained in them were greater than their value as coins. Since the money in circulation would be reduced by this return of coins to bullion it is argued that the coin's value as money would soon rise because of its scarcity, thus restoring parity between bullion and coin. Furthermore, it would be impossible for one metal to drive the other out of circulation. There is no need to debase gold by an admixture of silver, however, so long as the stock of gold is adequate for monetary needs.

III. PRESENT-DAY MONETARY SYSTEMS

The Monetary System of the United States.—Although the dollar is defined as a specific amount of gold, a physical gold reserve is no longer required for Federal reserve notes. Since gold certificates were substituted for gold in this respect in 1934, the United States is not on the gold standard in the prewar sense of the term. The prewar gold standard was designed as an *automatic* means to control the volume of bank notes and bank deposits. The present control of bank notes and especially of bank deposits is anything but automatic and is designed, not to keep the volume of notes and deposits *down* to the amount set by the legal gold reserves, but to keep the volume of notes and deposits from *reaching* the limit provided by the legal gold reserves. In reality we have a type of *managed currency*.

Many people believe that we departed from the gold standard and adopted a managed currency system in 1934 with the devaluation of the dollar. It is true that we eliminated many of the technical conditions of the gold standard discussed in the previous section, but the *automatic* features of the gold standard had been abandoned long before that time. Since the war, little attempt has been made to regulate notes and deposits in accordance with the amount of gold. In general the tendency has been to prevent currency, and especially deposits, from reaching the limits permitted by the amount of gold in the country.

The Monetary System Prior to the New Deal.—Prior to the New Deal the following kinds of money circulated in the United States:

- I. Coined money.
 1. Gold coins (\$5, \$10, and \$20 denominations).
 2. Silver dollars and subsidiary silver.
 3. Nickel 5-cent pieces.
 4. Bronze cents (95 percent copper).
- II. Paper money.
 1. Certificates.
 - a. Gold certificates.
 - b. Silver certificates.
 2. Notes.
 - a. Government notes.
 - (1) United States notes ("greenbacks").
 - (2) United States Treasury notes of 1890.

b. Bank notes.

- (1) Federal reserve bank notes.
- (2) Federal reserve notes (issued by Board of Governors through Federal reserve banks).
- (3) National bank notes.

The gold dollar was defined as 23.22 grains of pure gold and 2.58 grains of pure copper, or a total of 25.8 grains of gold nine-tenths fine. Few gold coins were in circulation, since gold certificates were preferred. Gold certificates were receipts for gold deposited in the United States Treasury. Silver dollars circulated in the western states, but silver certificates were used almost exclusively in the rest of the country. Of the different types of notes, the Federal reserve notes were the most important. The others circulated in small amounts and possessed varying degrees of legal tender.

New Deal Changes.—The changes made in the monetary system of the United States by the New Deal were designed primarily to restore confidence in the monetary and banking system and to aid economic recovery by raising prices. As will be shown more fully in Chap. IX, the general price level is a significant factor in business activity, and especially is this so when the price level is changing rapidly. The action taken by the government with regard to gold and silver was expected to result in a rise in prices.

1. *Gold.*—The United States really departed from the gold standard in 1933 at the time of the banking crisis. When President Roosevelt declared the bank holiday on March 6, 1933, he also forbade the exportation of gold and ordered everyone holding gold coin to turn it in at the Treasury or at Federal reserve banks in exchange for other forms of money. This action took gold out of circulation and prohibited its free import and export, two fundamental conditions of the gold standard. After the bank holiday, the embargo on gold was not removed, and on April 20 it was extended indefinitely. The next step with regard to gold was the abrogation on June 5 of the gold clause in existing governmental and private obligations, which required debt payment in gold coin of a given weight and fineness.

The first positive attempt to raise prices by means of changing the status of gold in the monetary system came with the Gold Purchase Plan in October of 1933. It will be recalled that one

of the requirements of a gold standard is that the standard money unit be defined as a fixed quantity of gold and be freely coined at that ratio. The old ratio of 23.22 grains of pure gold to the dollar meant that an ounce of gold was worth \$20.67 at the mint. In 1933, however, gold was selling for substantially more than this amount in the free gold market. The plan was inaugurated to remove the control of the gold value of the dollar from abroad and to return it to the United States. This step was believed necessary to prevent dollar disturbances created abroad from interfering with attempts to raise domestic commodity prices. The Gold Purchase Plan authorized the Reconstruction Finance Corporation to buy gold newly mined in the United States at prices to be determined from time to time after consultation with the Secretary of the Treasury and the President. It also provided that gold might be bought and sold in the world gold market whenever necessary in order to raise prices. The official price of gold was set at \$31.36 per ounce on October 25, 1933, and raised to \$34.45 an ounce on January 31, 1934. Whatever its ultimate effect may have been, the Gold Purchase Plan was not immediately successful in raising internal prices, as shown by the fact that the Bureau of Labor Statistics' all commodities index remained at 71 (1926 = 100) during October, November, and December and moved up only one point to 72 in January, 1934.

The next step with regard to gold was the Gold Reserve Act of 1934, which became law on January 30. This act vested in the United States Treasury the legal title to all gold held by the Federal reserve banks or the Federal Reserve Board. The banks and the board were given gold certificates or credit on the books of the Treasury in exchange for the gold. The act also authorized the Secretary of the Treasury to issue regulations concerning the use of gold and its export. The President was given power to reduce the weight of the gold dollar by not less than 40 percent and not more than 50 percent. In the event of devaluation, it provided for the establishment of a 2 billion dollar stabilization fund out of the profits of devaluation. This fund was to be used to stabilize the exchange value of the dollar in terms of foreign currencies. The Gold Reserve Act also contained some interesting provisions with regard to silver, which will be taken up in the next section.

On January 31, 1934, the President by proclamation fixed the weight of the gold dollar at $15\frac{5}{21}$ grains nine-tenths fine. This was a reduction of 40.94 percent in the gold content of the dollar. The price of gold thus was fixed at \$35 per ounce. This action automatically created the 2 billion dollar stabilization fund mentioned above. Following the proclamation, the Secretary of the Treasury issued a series of regulations regarding the purchase and sale of gold by the mints and the purposes for which gold might be used and/or obtained by purchase from the mints. Under these regulations gold could be obtained or held in limited quantities for use in the arts, the professions, and industry without license, and in larger amounts with a license. The Federal reserve banks were given permission to redeem gold certificates in gold bullion, in such amounts as the Secretary of the Treasury should deem necessary, to settle international balances or to maintain the parity of monies of the United States with gold. Gold also might be obtained for certain other purposes not inconsistent with the intent of the law.

Fixing the gold content of the dollar and providing for the export of gold for settling international balances has led some economists to maintain that the United States is now on a modified gold standard. This standard might be called the *gold export standard*, but one should keep in mind that it does not provide for automatic control of the volume of deposits and notes in the sense that the prewar gold standard did.

The Sterilization of Gold.—The United States at the present time finds itself in the position of having set a price for gold which is so high that it is the largest gold buyer in the world. As a result most of the newly mined gold comes to the United States, where it serves as a base for the potential expansion of credit. To prevent the incoming gold from getting into the currency base, the Treasury has resorted to a policy of “sterilization” of gold imports. Since the incoming gold is deposited in the banks and given by them to the Treasury, the problem is one of giving the banks something other than gold certificates in return for the gold. The Treasury accomplishes this purpose by borrowing the funds to buy the gold. This is done by issuing bonds in exchange for the gold. The net result is that the national debt is being increased—interest is paid on this money,

but no return other than the gold, which is buried underground in a vault at Fort Knox, Kentucky, is received.

2. *Silver*.—Most legislation in the United States with regard to silver has been either of an inflationary type or the result of concessions to the “silver interests.” In the Gold Reserve Act of 1934 the President was authorized, at his discretion, to reduce the weight of the silver dollar in proportion to the devaluation of the gold dollar, to reduce the weight of subsidiary silver coins, to cause silver certificates to be issued against silver bullion held by the Treasury and, in the event of a return to bimetallism, to give silver certificates in exchange for silver bullion to holders or producers of silver.

On December 21, 1933, the President, by proclamation, authorized the mints to accept domestically produced silver for coinage into silver dollars. It was provided that the mints levy a seigniorage charge of 50 percent, *i.e.*, only half the silver presented would be returned as coin, the other half being retained by the Treasury. This action fixed the price of silver at $\$0.64\frac{1}{2}$ per ounce, which was well in excess of the current market price and hence represented a subsidy to the silver interests. The silver interests were not satisfied, however, and in 1934 the Silver Purchase Act became law. Among other things, this act directed the Secretary of the Treasury to buy silver at home and abroad at such times, rates, and terms as he deems to be in the public interest. To restrict profiteering, the act provided that silver produced prior to the passage of the act should not be purchased at more than 50 cents per ounce. Certain provisions regarding the sale of silver, should the market price exceed the monetary value, also were included.

Purchases of silver under the act have varied in amount. Late in 1934, however, so much of it was purchased abroad that China, which was then on the silver standard, was forced to abandon it because its silver reserve was depleted.

Foreign Monetary Systems.—Since 1931 practically all the European nations have abandoned the gold standard and have adopted some form of managed currency. It is highly unlikely that this situation will be altered much until the various nations can agree on a concerted policy regarding their future monetary actions. The depression beginning in 1929 brought with it a wave of “nationalism” which has made agreement on monetary

policies well-nigh impossible. The question of a monetary system is intimately connected with that of international trade and, as will be shown in Chap. X, certain temporary advantages in trade can be secured by devaluation of the currency. Until there is some agreement on tariffs, war debts, and armaments, the future of unified monetary action will be highly uncertain. While space does not permit a discussion of the various foreign monetary systems, we may describe briefly some of the alterations of the conventional gold standard which have been made since the World War.

The Gold Bullion Standard.—During the war and for years thereafter, most European countries found their supply of gold inadequate to support, at the old ratio, the volume of notes and deposits necessitated by war finance. As a result of these factors and others, including war-debt and reparations payments, some of the countries were forced to modify the conventional requirements when they returned to the gold standard. The gold bullion standard, adopted by England in 1925, was one of these modifications. Under this standard gold could be sold to the Bank of England at a fixed price, but could not be coined at the mint. Gold could be obtained at a fixed rate from the Bank of England, but only in amounts of 400 ounces or more. Gold thus served as security for notes and bank deposits and for settlement of foreign balances, but not as a direct medium of exchange. The Bank of England no longer buys or sells gold at the mint at a fixed price since the abandonment of the gold standard in 1931, but a similar result is accomplished through the use of an "equalization fund." Gold is bought and sold as a commodity in London in the same way that wheat is bought and sold. The British government, by using its equalization fund, can fix the price of gold on the gold market so that an ounce of gold will continue to sell for a fixed price as long as the fund is solvent.

The Gold Exchange Standard.—Another form of the gold standard was adopted by Germany and other countries. Under the gold exchange standard, the German Reichsmark was defined as a specific weight of gold, but gold did not circulate within the country and the bank notes and bank deposits were not backed by a *specific percentage* of gold. The government attempted to maintain sufficient deposits in foreign countries, however, to

insure the payment of foreign balances. By so doing it was able to maintain the currency at par with that of other countries on the gold standard. It thus secured the advantage of the gold standard as far as international trade was concerned.

Problems

48. What gives a dollar bill its value?
49. How, if at all, would the following affect (1) the value of gold and (2) the price of gold:
 - a. A sharp decline in gold production?
 - b. A decline in the production of other commodities?
 - c. An act of Congress doubling the weight of the gold dollar?
 - d. The printing of a great quantity of inconvertible paper money?
50. What service does gold perform in the money system of the United States at the present time?
51. "It has been proposed that every worker should receive one exchange-unit for every hour he works, and the price of each commodity should be as many exchange-units as it took hours to produce it." Appraise this "labor-hour" unit-of-exchange proposal.
52. If gold does not circulate as money, how can the sterilization of part of the gold supply have any effect upon the money system? Can it have any effect upon the prices of such commodities as copper and potatoes?

References

- BRADFORD, F. A.: "Money and Banking," Longmans, Green & Company, 1936.
- DONALDSON, JOHN: "The Dollar," Oxford University Press, 1937.
- DOWRIE, G. W.: "Money and Banking," John Wiley & Sons, Inc., 1936.
- FOSTER, W. T., and WADDILL CATCHINGS: "Money," Houghton Mifflin Company, 1927.
- GARIS, R. L.: "Principles of Money, Credit and Banking," The Macmillan Company, 1934.
- KEMMERER, EDWIN W.: "Money," The Macmillan Company, 1935.
- KILBORNE, RUSSELL D., and G. W. WOODWORTH: "Principles of Money and Banking," McGraw-Hill Book Company, Inc., 1937.
- WOODWARD, DONALD B., and MARC A. ROSE: "A Primer of Money," McGraw-Hill Book Company, Inc., 1937.

CHAPTER VIII

CREDIT AND BANKING

Today over 90 percent of the volume of money transactions in the United States are effected by means of bank checks and drafts. To handle this enormous volume of business is the work of the commercial banks and of the Federal Reserve System. Such an extensive use of checks is made possible by the highly integrated nature of the modern banking system. This integration is aided by the Federal Reserve System.

I. COMMERCIAL BANKS

The Nature of Commercial Banking.—Commercial banks are so called because they furnish funds for the manufacture, transportation, and marketing of goods; in other words, for the commerce of the country. While they furnish funds also for investment, for the construction of homes, and for the purchase of automobiles and other consumers' goods, the bulk of their business consists of loans to businessmen. These loans ordinarily take the form of "demand deposits" given by the bank to the borrower. The borrower writes checks against his account when he wishes to make payments to other persons. To see how this is done, and the way in which it facilitates business, let us examine the organization and operation of a commercial bank.

Organization.—The organization of a bank involves certain legal and technical formalities. State banks must conform to state laws and national banks to federal laws. The initial capital of a bank is provided by the stockholders. Suppose that a new bank, the Second National Bank, is to be organized with a capital of 2,000 shares of stock with a par value of \$100 per share. To meet federal bank regulations, a newly organized national bank must have a paid-in surplus equal to 20 per cent of its capital stock before it can begin operations. This regulation may be met by selling the stock for \$120 per share. The initial bank statement now reads:

Resources		Liabilities	
Cash.....	\$240,000	Capital stock.....	\$200,000
		Surplus.....	40,000

If the directors purchase a building for \$50,000 and equipment for \$10,000, the resources account of the bank's statement would show:

Resources	
Cash.....	\$180,000
Building.....	50,000
Furniture and fixtures.....	10,000

Since all national banks in continental United States must be members of the Federal Reserve System, this bank must buy stock in the Federal reserve bank of its district. The amount required at the present time is equal to 3 percent of the member bank's capital stock and surplus. Purchase of this stock would reduce the cash account by \$7,200 and would add a new account, Federal reserve bank stock, as follows:

Resources	
Cash.....	\$172,800
Building.....	50,000
Furniture and fixtures.....	10,000
Federal reserve bank stock.....	7,200

Deposits.—The banking crisis of 1933 made plain to the country that only a small portion of bank deposits is in the form of cash. Deposits arise either from the deposit of cash, checks, money orders, or from the granting of loans. Let us suppose that customers deposit \$25,000 in cash in the bank. The resources are increased by this amount, and a new liability is created. This liability may be either a time deposit or a demand deposit. If it is a demand deposit, it is subject to withdrawal by check at any time the depositor wishes. If it is a time deposit, the bank may require a certain period of notification before giving it to the depositor and will pay only on presentation of a passbook or certificate and not by check. If the \$25,000 deposit were a demand deposit, the bank statement would have the following additions:

Resources		Liabilities	
Cash.....	\$25,000	Demand deposits.....	\$25,000

Loans and Discounts.—The great majority of bank deposits are the result of loans by the banks to their customers. To see how these arise, let us suppose that the next caller at the bank wishes to *borrow* \$5,000 instead of to deposit cash. He might sign a note and ask the bank to give him the loan in cash. The chances are, however, that the borrower will want the bank to credit his checking account with the amount of the loan, so that he may continue his customary method of payment by check. In this case, the bank will increase its “loans and discounts” and also will increase its liability account a like amount by writing up “demand deposits.” Notice what has happened: A loan from the bank has been converted into a demand deposit, and the bank statement has been changed by the addition of the following entries:

Resources		Liabilities	
Loans.....	\$5,000	Demand deposits.....	\$5,000

If the interest on the loan had been deducted from the amount of the loan at the beginning of the period, it would then be called a *discount*. Thus if the loan had been made on a 60-day note, a deduction of \$50 (at 6 percent per year) would have been made. The bank statement would now show:

Resources		Liabilities	
Discounts.	\$5,000	Demand deposits.....	\$4,950
		Discount credited but not earned ¹	50

Investments.—Our bank thus far has earning assets of \$10,000 (the loan of \$5,000 and the discount of \$5,000) and \$197,800 in cash. Against these assets it has demand deposit liabilities of only \$34,950. It is apparent that it can increase its demand liabilities at least five times without incurring the danger of having insufficient cash to meet withdrawals. In addition to making loans the bank will want to convert a portion of its non-earning cash into earning assets other than commercial loans. It accordingly will buy some bonds. Some will be government bonds and some will be the bonds of private corporations. The bank will

¹ As fast as unearned discount is earned, it may be transferred to another liability item called “undivided profits,” some of which at the end of the fiscal period may be transferred to surplus or paid to stockholders as dividends.

attempt to buy only sound bonds, even though they yield a low return. If the bank invests \$100,000 in bonds, the bank statement appears as follows:

Resources		Liabilities	
Cash.....	\$ 97,800	Demand deposits.....	\$ 34,950
Investments (bonds).....	100,000	Discount credited but not earned.....	50
Loans and discounts.....	10,000	Capital stock.....	200,000
Federal reserve bank stock	7,200	Surplus.....	40,000
Building.....	50,000		
Furniture and fixtures....	10,000		
Total.....	\$275,000	Total.....	\$275,000

Check Clearing and Collection.—During the depression which began in 1929, the volume of bank loans declined and the rate of interest on investments was reduced so much that banks could not meet their operating expenses from the interest on loans and investments alone. The levying of “service charges” by most banks in 1934 was a recognition both of the importance of handling checking accounts and of the fact that depositors should pay the cost of maintaining these accounts. A checking account is a convenience for everyone and a necessity for many people. Its use eliminates the need to carry a large amount of currency, affords a convenient system of bookkeeping, and provides, in the form of the canceled checks, receipts for bills paid. With approximately 90 percent of the payments now being made by bank checks, the banking system in reality is a huge bookkeeping machine which transfers purchasing power from one person to another by means of book entries.

If both John Jones and Peter Smith have accounts at the Second National Bank, and Jones gives Smith a check for \$100, no net change appears in the bank’s statement. The only bookkeeping change is that the bank now has a liability of \$100 more to Smith and of \$100 less to Jones. A different condition exists, however, if the recipient of the check has his account with another bank. If this bank is in the same city, and the city is large enough, the check will be handled through a “clearinghouse.” In the ordinary course of business each bank receives a number of checks drawn on other banks. It might take these checks directly to the various banks on which they are drawn and demand payment but this would be an inefficient way of handling them. It is much more convenient for representatives of the various

banks to meet at a central office and to exchange their checks with one another so that only the balances need to be settled in cash. This exchange is accomplished at the clearinghouse. A similar service for banks in different cities is provided by the Federal reserve banks. The operation of this service will be discussed in connection with the Federal Reserve System.

Types of Bank Loans.—Bank loans may be classified in various ways, as time loans and demand loans, individual loans and corporation loans, or secured loans and unsecured loans. Strictly speaking, however, there are no unsecured loans. The term simply means that the physical possession of the security is not obtained by the bank. The banker, through various tests, attempts to determine if the borrower is likely to repay the loan. Typical questions which a banker usually asks when a prospective customer applies for a loan are:

1. What has been the borrower's average daily balance for the previous three months?
2. What amount, if any, does he owe this bank now?
3. How is it secured?
4. What is the borrower's net worth?
5. What liability has he other than to this bank?

Whatever facts the bank may wish to know, it invariably tries to ascertain if the applicant is a good moral risk. If a person wishes to obtain and to retain good credit standing, he must meet the test of the banks in his community.

When manufacturing corporations or business houses seek a short-term unsecured loan, they must present a statement of assets and liabilities. The bank is particularly interested in current assets and liabilities. *Current assets* consist of free balances in banks; of finished goods, goods in process, and raw materials; and of accounts and notes receivable. *Current liabilities* consist of accounts, notes, and other obligations payable within a year. The difference between current assets and current liabilities normally is the maximum amount which the firm can expect to borrow at a commercial bank. If the banker thinks that the value of the assets will shrink in the future, he will correspondingly reduce the amount of the loan. The actual amount granted as a loan also will depend upon the value of the firm's fixed assets, such as land, buildings, plant, and equipment.

A secured loan is one that is safeguarded by collateral. Although the bank always is interested in the character of the borrower, in granting a secured loan it places major emphasis on the value of the collateral. It wishes to know not only what the collateral is worth at the time the loan is made, but also what it may be worth at the time the loan matures and how readily it can be converted into cash. Among the principal types of collateral are warehouse receipts for goods in storage, such as wool, tobacco and coffee; stocks and bonds; accounts receivable; and real estate mortgages.

The majority of borrowers from commercial banks also are depositors. Since the bank is interested in the cash position of its borrowers, it usually insists that their free cash balances bear a certain relation to the size of the loan. Thus if a merchant regularly kept a cash balance of about \$10,000 in his bank and needed a \$50,000 loan, the bank might insist that the average cash balance during the period of the loan be maintained at something near \$10,000. This practice often is referred to as the "20 percent rule."

How Much Can a Bank Lend?—The lending power of a bank is restricted by law and by economic necessity. Some persons believe that a bank can grind out credit endlessly. A bank cannot lend what it does not have, however, or at least what it does not expect to have. If all bank loans were made in cash, their total would of necessity be limited to the amount of cash in the vaults of the banks. But most commercial loans, as we have seen, are not made in cash, but in the form of checking accounts which automatically increase the bank's deposits. Since the bank legally is required to pay a depositor at any time the amount to which he is entitled, it must have on hand at all times sufficient cash to meet withdrawals; or, in lieu of cash, since most checks go through the clearinghouse for collection, the bank on which they are drawn must be able to offset them at the clearinghouse by presenting checks drawn upon other banks.

Banks find in practice that a certain amount of cash is necessary to meet the day-to-day demands of their customers. This amount depends on several factors. The first of these is the number of depositors. The smaller the number, the greater the proportion of the total deposits which must be kept in the form of cash. If a bank had only one depositor, a 100 percent reserve

would be required because this individual might demand his entire deposit at one time. If there are a large number of depositors, the chances are that the withdrawals made by some depositors will be counterbalanced by deposits on the part of others. Another factor affecting reserves is the nature of the business in the community. If the bank is located in a town in which there is only one industry, and this industry is seasonal in nature, there will be seasonal withdrawals and deposits of cash. The bank must have a large percentage of its deposits in the form of cash at the season when heavy withdrawals are being made by local industries. The greater the diversification of industry, therefore, the smaller the cash reserves which will be required.

It is apparent that the larger the proportion of its deposits which a bank must have in the form of cash, the less remains which it can lend by granting demand deposits to the borrowers and, conversely, the smaller the proportion of deposits held in cash the more it can lend. In the United States the minimum ratio of reserves to deposits is prescribed by law. Banks which are members of the Federal Reserve System must have deposits at their district Federal reserve banks of from 7 to 13 percent of their demand deposits, depending on the city in which the bank is located, and 3 percent of their time deposits.¹

Although the law prescribes minimum reserves and economic conditions may make it necessary to maintain even higher reserves in certain instances, our individual bank cannot expand credit without regard to the action of the other banks. If it attempts to expand credit up to the limit of its legal reserves and other banks are not expanding credit at as rapid a rate, it will soon lose cash through unfavorable clearinghouse balances. This loss is due to the fact that not all the customers who borrow from the bank will send their checks to people who deposit in that particular bank. A certain proportion of the checks will be deposited in other banks and will be presented to our bank for payment. Since the other banks are not expanding credit at the same rate, our bank will not have enough checks on other banks to balance

¹ For the purpose of credit control, the Board of Governors is empowered to increase these amounts by as much as 100 percent. Thus on May 1, 1937, member bank reserves against net demand deposits were 26, 20 and 14 percent, respectively, for central reserve cities, reserve cities, and country banks. These reserves later were reduced.

those on itself and so will lose cash. The loss of cash will force it to slow up its expansion of loans. Only when all banks expand credit together can loans come into existence which are equal to several times the total cash holdings in the banking system as a whole.

Let us assume that other banks are expanding credit to the limit of their reserves. We may then see how much credit our hypothetical bank might extend. If our bank is located in Columbus, Ohio, it might have a reserve at the Cleveland Federal reserve bank of 20 percent of its demand deposits. If it deposited its total amount of cash, or \$97,800, it could expand loans until its deposits reached \$489,000. Since some cash must be kept in its own vaults, however, the bank could not deposit the full \$97,800. Let us suppose that \$7,800 is sufficient for its day-to-day needs. If it places the remaining \$90,000 in the Federal reserve bank, it could expand its loans. If this procedure were followed during the course of a year, we might find the bank statement at the end of that time to be as follows:

Resources		Liabilities	
Cash and due from banks.	\$ 97,800	Demand deposits	\$329,000
Investments (bonds)	100,000	Discount credited but not	
Loans and discounts	325,000	earned.	1,000
Federal reserve bank stock	7,200	Capital stock.	200,000
Buildings	50,000	Surplus.	40,000
Furniture and fixtures	10,000	Undivided profits	20,000
Total	\$590,000	Total	\$590,000

Bank Failures.—There were 14,336 fewer banks of all kinds in 1936 than in 1920. Part of this decline is accounted for by consolidations and by a few voluntary terminations, but many of the banks were discontinued because of failure. There are many causes for bank failures. The epidemic of failures between 1929 and 1933 was due largely to public hysteria, which sometimes was justified by the condition of the bank and at other times was entirely unfounded. Even a bank that is well managed and in sound condition cannot stand a “run” without aid from other banks. Consider the case of our hypothetical bank. If all the depositors requested cash at once, an immediate outlay of \$329,000 would be required. Even if the bank could obtain all the money due it from other banks in the form of deposits, loans, and so on, it could pay only a little more than 20 cents on the dollar immedi-

ately. If it could sell all its stocks and bonds at the value listed on the balance sheet, it could pay only 55 cents on the dollar. The banking laws which require a bank to pay its deposits on demand obviously cannot be enforced if all depositors demand cash at the same time. To enforce this requirement would make it impossible for a bank to carry on its primary function of credit extension. If a bank kept in its vaults every penny it received, it would be at most a storage warehouse and not a commercial bank.

The desire of people to withdraw their money from the bank sometimes is prompted by the belief that the bank's resources are in a frozen condition; in other words that its loans, for the time being, are not collectable without a considerable reduction in principal. In a period of falling prices, the value of the resources of most banks declines, but any individual bank may have this experience in good times as well as in bad ones. A bank may err if it tries to lend too much, if it lends to irresponsible parties, or if it fails to diversify its loans sufficiently. Then, too, some banks fail for the same reason that many other businesses fail, namely, the inability to meet competition because of inefficient management, high operating expenses, and so on.

Deposit Insurance.—The banking crisis of 1933 resulted in a popular demand for federal insurance of bank deposits. The Banking Act of 1933 accordingly set up the Federal Deposit Insurance Corporation (to be referred to as the FDIC). The capital of the FDIC was provided by the Federal reserve banks and the United States Treasury. The Banking Act of 1935 amended the provisions regarding the FDIC in several important details. All members of the Federal Reserve System are required to join the FDIC. State banks and trust companies may join if they meet certain requirements. After July 1, 1942, however, banks having deposits of \$1,000,000 or over must be members of the Federal Reserve System to participate in deposit insurance. Deposits up to \$5,000 are completely insured under the present law. Participating banks pay an annual premium equal to $\frac{1}{12}$ of 1 per cent of their total deposits.

The procedure of the FDIC in the event of the failure of a participating bank is complicated and can be sketched only in broad outlines here. In case of the failure of a national bank, the Comptroller of the Currency is required to appoint the FDIC

as receiver. The receiver is required to establish a new national bank, without capital stock, to take over the liabilities of the failed institution. Depositors of the insolvent bank then may withdraw their deposits, up to \$5,000, or may leave them on deposit with the new bank. In the latter case, they are segregated from other accounts. The FDIC undertakes the liquidation of the assets of the failed bank, reimburses itself for deposits paid out and makes payments on deposits in excess of \$5,000 if the funds obtained from the liquidation are sufficient. The FDIC is authorized to sell stock in the new bank to stockholders of the failed bank or to others, if it is desirable and possible to do so, whereupon the new bank would become a regularly operating national banking association. The new bank is voluntarily liquidated, after two years, if stock has not been sold or if the assets were sold to an existing bank.

The procedure is somewhat more complicated with respect to the failure of a participating state bank, because of the state laws regarding receiverships, but in general it follows similar lines; a new national bank may be established to take over the liabilities of the insolvent institution.

As it now stands, the FDIC insures over 98 percent of the total *number* of the bank deposits in participating banks. Only 44 percent of the total *amount* of bank deposits in participating banks is insured, however. This means that the large banks must bear more than their share of the cost of deposit insurance, since the premiums are based on the *total* deposits rather than on the *insured* deposits. The FDIC plan is not an insurance scheme in the exact sense of the word, since premiums are not based on the risk involved, nor are sufficient data regarding bank failures available to allow the premiums to be based on actuarial figures.

The Federal Government and Early Banking.—Prior to the Civil War, the national government, although it failed to provide any direct supervision for banks, engaged in two banking enterprises of its own. The First Bank of the United States was established in 1791. The United States government, through partial ownership and control, hoped to use the bank as a regulator of the currency. The bank's charter expired in 1811.

Five years later the Second Bank of the United States was established. Like the first bank, it became involved in politics

and, probably against the best interests of the country, was discontinued in 1836. The period from 1836 to 1863 has been designated as one of "wildcat" banking because control by the states was ineffective, many banks failed, and bank notes had widely fluctuating values owing to differences in redemption policy.

National Bank Notes and Government Control of Banking.—When the Civil War began in 1861, the government felt the dual need of a sound bank-note currency and a controlling hand on banking business in general. The government also had difficulty in selling bonds to aid in financing the war. Accordingly, the National Banking Act was passed in 1863. Thus banks might become members of the National Banking System thereunder created if they secured a federal charter and met the various governmental requirements. Once having done so, these banks were permitted to issue national bank notes, whereas state bank notes were so heavily taxed as to be forced out of circulation. The national banks which issued notes were required to deposit in the United States Treasury certain bonds of the United States government to an amount at least equal to the value of the notes. In addition, the banks were required to keep with the Treasury a gold redemption fund equal to 5 percent of the value of outstanding notes. Since 1935, however, the bonds on which the national bank notes were based have been retired. The various national banks are required to keep on deposit with the United States Treasury an amount equal to the value of their notes still outstanding. As a result, all national bank notes will have been retired from circulation within a few years.

Weaknesses of the National Banking System.—The new banking system, although a considerable improvement over the old one, had some serious defects. The currency was *inelastic*, *i.e.*, the supply of national bank notes could not readily be changed to meet the fluctuating needs of business. Since the notes were secured by government bonds, the price of bonds was the determining factor in note issue. No matter how much the banker paid for bonds, his note-issue privilege was limited to their par value. If bond prices were below par, the market value limited the note issue. Frequently when the bond market was favorable to note issue, the depressed state of business made additional bank notes unnecessary or even harmful.

Defects in bank *reserves* were more serious than defects in bank-note issue. Individual bank reserves were either 15 or 25 percent, depending upon the location of the bank, but the reserves of the system were not susceptible to ready mobilization and were but weakly controlled. This was due to the fact that banks were not required to keep their reserves in a central depository or to cooperate in times of emergency. Banks outside the central reserve cities (New York, Chicago, and originally St. Louis) were permitted to keep a part of their reserves in larger city banks and generally did so to obtain the small interest rate paid on these deposits.

In addition to an inelastic currency and an unsatisfactory reserve requirement, the National Banking System possessed no adequate machinery to rediscount commercial paper, no nationwide collection and transfer agency, no appreciable regulation of the international flow of gold, and no means of credit control. These defects made important changes inevitable.

II. THE FEDERAL RESERVE SYSTEM

A "super" banking system was introduced in 1913 as a result of a series of money and banking difficulties which centered about the defects in the banking system just discussed and which culminated in the panic of 1907. This system automatically included every national bank in the United States, and state banks were allowed to secure membership if they met specific requirements.

The Federal Reserve System was an addition to, rather than a substitute for, the old system. Moreover, it was the result of a compromise between centralized and decentralized theories of banking, opposing points of view which have played an important part in all our political affairs since our government was first established. This compromise between viewpoints appears both in the organization and in the operation of the Federal Reserve System. The Banking Acts of 1933 and 1935, however, materially changed the organization of the Federal Reserve System in the direction of more centralized control.

The Organization of the Federal Reserve System.—The Board of Governors is the highest governing body in the Federal Reserve System. It consists of seven persons, appointed by the President with the advice and consent of the Senate. The members

hold office for a term of 14 years, one term expiring every 2 years. The salary is \$15,000 per year, and no member is allowed to serve more than one term. Two of the seven members of the Board of Governors are designated by the President as chairman and vice-chairman, respectively, to serve in this capacity for 4 years of their terms.

In contrast with most other countries, in which there is only one central bank, there are twelve Federal reserve banks, each representing a district as shown in the accompanying map.

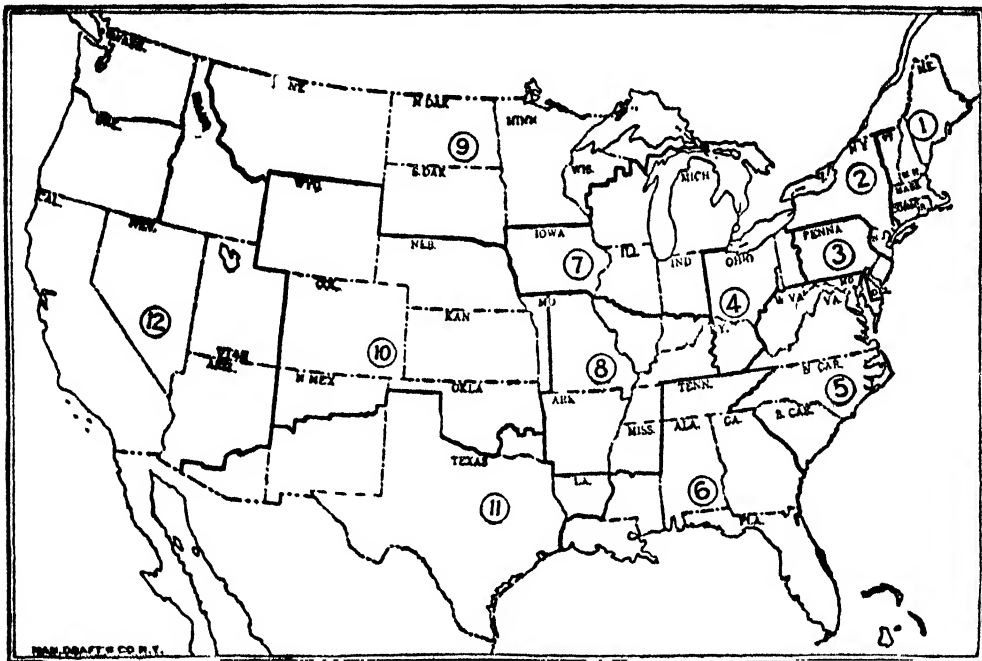


FIG. 7.—Federal reserve districts.

- | FEDERAL RESERVE CITIES | | |
|------------------------|---------------|--------------------|
| 1. Boston. | 5. Richmond. | 9. Minneapolis. |
| 2. New York. | 6. Atlanta. | 10. Kansas City. |
| 3. Philadelphia. | 7. Chicago. | 11. Dallas. |
| 4. Cleveland. | 8. St. Louis. | 12. San Francisco. |

Each Federal reserve bank not only is a central bank for its district but also is one of the twelve coordinated units of the system supervised by the Board of Governors.

Reserve Banks Are Banker's Banks.—The stock of a Federal reserve bank is owned by the member banks of the district. Six of the nine directors are elected by the member banks. Three of these, Class *A* directors, are the direct representatives of the member banks. Three more, Class *B* directors, are elected to represent industry, commerce, and agriculture. The three remaining directors, Class *C*, are appointed by the Federal

Reserve Board. The reserve banks deal chiefly with member banks in somewhat the same way that a commercial bank deals with its customers.

Control of Credit.—The reader will recall not only that a considerable proportion of the means of payment of the country is provided by the commercial banks as loans to businessmen in the form of demand deposits, but also that the amount of credit which can be extended in this way by a particular bank depends upon the ratio of its reserves to its deposits—for which a minimum ratio is fixed by law. The effect of this expansion of credit on business activity has become increasingly important as business has become more complex. Some people explain the business cycle as a result of alternate periods of credit expansion and contraction. While this explanation is questionable, the problem of credit expansion and contraction is one of the most important in modern economic life. As a result, the problem of credit control has become increasingly significant. In the minds of many economists, the most important function of the Federal Reserve System is that of controlling the amount of credit in the nation. The Banking Act of 1935 is a reflection of this viewpoint.

Since the extent to which commercial banks can expand credit depends on the ratio of their reserves to their deposits, control of credit must come through effecting changes either in the volume of reserves or in the legal ratio between reserves and deposits. In the following sections the relationships between the Federal reserve banks and the member banks will be discussed in relation to the general problem of credit control.

Member Banks' Reserves.—Each member bank has a book account with the Federal reserve bank of its district in a manner somewhat similar to a customer's account with the member bank. A member bank is required to maintain on deposit with the Federal reserve bank in its district a reserve equal to a certain percentage of its time and demand deposits. The member banks are divided into three classes: country, reserve city, and central reserve banks. All banks are required to maintain a minimum reserve of 3 percent against time deposits. The country, reserve city, and central reserve city banks are required to maintain minimum reserves of 7, 10, and 13 percent respectively against demand deposits. Thus the legal reserves of members are mobilized in the Federal reserve banks.

The Banking Act of 1935 authorized the Board of Governors to increase these reserve requirements by not more than 100 percent. This provision was included because excess reserves had become so great that there was considerable danger of inflation based on an expansion of credit. On August 15, 1936, the reserve requirements for both time and demand deposits were raised 50 percent for all classes of banks. At that time the reserves of member banks were \$6,300,000,000, of which \$2,900,000,000 were required reserves and \$3,400,000,000 were excess reserves.¹ The increase in required reserves amounted to \$1,450,000,000, so that excess reserves were reduced to about \$1,900,000,000. On January 31, 1937, the Board of Governors announced a further increase in reserve requirements of 33⅓ percent, one-half to be effective as of March 1, 1937, and the remaining half on May 1, 1937. This action exhausted the board's power to increase reserve requirements and reduced excess reserves to approximately \$500,000,000.

How Reserves Are Acquired.—Member banks may acquire balances with the district reserve banks in the same way that individuals may acquire balances at member banks. They may deposit cash or checks; they may sell government bonds or commercial paper to the reserve banks; or they may borrow directly from the reserve banks. The excess reserves discussed in the preceding section were acquired in part because customers' deposits in the member banks were reduced during the depression, but chiefly through the deposit of cash. This cash was in the form of gold, which was shipped in from abroad.

When member banks want to build up their reserves in order to expand credit, they usually either borrow directly from the reserve banks or sell securities in the open market and deposit the proceeds of the sale. The former method may take the form of borrowing on the bank's own note or of selling customers' notes or commercial paper to the reserve banks. The latter procedure is called "rediscounting." The discussion of commercial banking indicated that interest frequently is deducted in advance when a loan is made. The borrower, let us say, gives the bank his note for \$5,000, but receives a deposit for only \$4,950. Thus his note was discounted at 6 percent for 60 days. The bank now may sell this note to its district Federal reserve bank.

¹*Federal Reserve Bulletin*, August, 1936.

The reserve bank may *rediscount* it at 5 per cent, *i.e.*, it will credit the bank with \$4,958.33. On this transaction the member bank makes a profit of \$8.33 from the difference between 6 per cent and 5 per cent for 60 days on \$5,000.

The rediscount rate (5 percent in this case) is one of the devices used by the Federal reserve banks to control the expansion of credit. If the rate is raised, it reduces the profits of the member banks from rediscounting and may force them to restrict their loans to customers because of insufficient reserves. If the rate is lowered, it becomes more profitable for member banks to obtain the reserves needed to support additional loans and hence may provide a stimulus for the expansion of credit.

Open-market Operations.—Changing the rediscount rate is effective in restraining the expansion of credit only if the member banks have to borrow, *i.e.*, when they have no excess reserves. Since this is not always the case, the reserve banks have another device to control credit, namely open-market operations. Open-market operations refer to the purchase or sale of certain types of securities in the regular security markets. If the reserve banks wish to curb the expansion of credit, for instance, they may *sell* government bonds in the open market. The purchasers of these bonds probably will pay for them with checks on commercial banks. The reserve banks will charge these checks against the balances of the member banks. This action reduces their reserves and will force them either to curb their loans or to build up the reserves again. If they attempt to build up their reserves, they will encounter the high rediscount rate, which may make the further expansion of loans less profitable.

If the reserve banks *buy* securities in the open market, they will pay with checks on themselves. These checks will be deposited with the commercial banks, and will be sent to the reserve banks to be added to the balances of the member banks. This procedure builds up reserves and stimulates lending because it is unprofitable to have excess reserves since interest is not paid thereon.

Federal Reserve Notes.—The provision for the issuance of Federal reserve notes contained in the original Federal Reserve Act was designed to eliminate the *inelasticity* which characterized national bank notes. To make the Federal reserve notes elastic, it was thought necessary to base them on a type of security which

expanded and contracted with the changing volume of business. The Federal reserve notes accordingly were based on a combination of gold and commercial paper. The minimum reserve in gold was 40 percent, and the remainder of the reserve was commercial paper. The commercial paper represents credit based on goods for sale or other assets which, within a short period, will provide the funds to retire the credit instruments. When the volume of commercial paper declines, the volume of Federal reserve notes for which it served as security also is reduced.

With the passage of the Glass-Steagall Act in 1932, however, these provisions were changed so that government bonds might serve as security in place of commercial paper. This change was necessary because there was not enough commercial paper to serve as security for the volume of Federal reserve notes required. At that time only a relatively small portion of the reserve behind Federal reserve notes was in the form of commercial paper, the rest being in gold. The drainage of gold out of the country threatened to reach the point at which Federal reserve notes would have to be retired from circulation. Permission to use government bonds instead of commercial paper released an amount of gold equal to approximately 60 per cent of the amount of Federal reserve notes outstanding.

In actual practice, the volume of Federal reserve notes has come to bear little relation to the volume of commercial paper. When business requires more currency because of seasonal needs, such as the Christmas season, or because of an increase in the price level, it draws cash out of the member banks and they in turn ask the Federal reserve banks for Federal reserve notes. As long as the reserve banks have adequate collateral in the form of gold and commercial paper or government bonds, the demand for additional notes can be met promptly. When the need for the additional currency declines, businessmen deposit the surplus Federal reserve notes and these are sent by the member banks to the reserve banks for retirement, thereby providing elasticity for the note issue.

Clearing and Collections.—The district Federal reserve banks provide somewhat the same clearing and collection service for their member banks that the local clearinghouses do for banks in a given city. If a merchant in Columbus, Ohio, gives a wholesaler, in Cleveland, Ohio, a check on a Columbus bank, for

instance, the check probably will be collected through the Federal reserve bank at Cleveland. The Cleveland merchant would deposit the check in his local bank, which in turn would send it to the reserve bank for collection. The reserve bank would credit the Cleveland bank's account and charge the Columbus bank's account.

Collections between banks located in different Federal reserve districts are handled through the Gold Settlement Fund in Washington. If the Columbus merchant had sent his check to a wholesaler in New York, it would have been deposited in a New York bank and sent by it to the New York Federal Reserve Bank for collection. The New York Federal Reserve Bank would have credited the member bank and sent the check to the Cleveland Federal Reserve Bank. The Cleveland reserve bank would charge the Columbus bank's account and send the check on to Columbus, where it would be charged against the merchant's account. The transaction between the two Federal reserve banks would have been settled by means of the Gold Settlement Fund. The New York reserve bank would notify the Gold Settlement Fund in Washington, D. C., to add the amount of the check to its balance and deduct it from that of the Cleveland Federal Reserve Bank. The Gold Settlement Fund is deposited with the United States Treasury and is administered by the Board of Governors of the Federal Reserve System.

Foreign Banking Systems.—Whereas the United States has twelve central banks, under the unified control of the Federal Reserve Board of Governors, most foreign countries have but one. Foreign central banks perform the same general functions as our reserve banks; that is, they serve as bankers' banks and act as the fiscal agents for their respective governments. The Bank of England, chartered in 1694, in addition to its services for the government, also carries on a general banking business for the public through a system of branch banks. The central bank of Germany, the Reichsbank, is also privately owned, but the central government, as in some other countries, is assuming more and more control over its activities.

The outstanding difference between banking in the United States and that in other countries appears in the organization of the local banks. Whereas this country relies upon a local unit banking system comprised of about 16,000 banks, European

countries and Canada have only a few banks each, but these banks have many branches. In England, for example, five joint-stock banks through their many branches do most of the regular banking business. Although there are few regulatory requirements for foreign bankers to observe, generally speaking, a new bank cannot come into existence without a special charter from the central government. The movement toward chain, group, and branch banking in the United States, although retarded by many influences, is slowly altering the structure of our banking system, constantly making it appear a little more like the banking systems of other countries.

III. OTHER CREDIT INSTITUTIONS

Industrial Credit Institutions.—Whereas commercial banks are concerned primarily with loans to businessmen, industrial banks are concerned with loans to workers, chiefly for consumption purposes. Some of these, such as the Morris Plan banks, are regular banking corporations; others, such as credit unions, are cooperative institutions. The latter type is becoming increasingly important at the present time. A credit union is a non-profit cooperative organization of individuals in a homogeneous group, such as the employees of a certain company or the members of a lodge. Each member contributes a minimum amount of capital and may borrow at reasonable rates of interest.

Investment Banking.—An expanding industrial society requires a source of supply of fixed capital. Before a new invention or a new process can be put to practical use, funds must be secured to construct buildings and to buy or to manufacture equipment. Some of these funds for long-time investment come from the earnings of the business; they are made possible by a financial policy of laying aside for reinvestment a part or all of the profits instead of distributing them in the form of cash dividends to stockholders. In many cases, however, it is necessary to go outside of the business for fixed capital. In response to this need, a number of investment banking houses have developed. The principal function of these banks is to market stocks and bonds on a wholesale basis, so as to assemble the savings of many persons and institutions for the conduct of business ventures.

The process of financing a new business or of providing additional capital for an existing one involves several fundamental

steps on the part of the investment banking house. If the investigation reports, which will be discussed below, are satisfactory in all respects, the investment banking house prepares the necessary circulars giving details of the company and a description of the securities about to be offered. If the issue of securities is larger than the investment house cares to market on its own account, it will effect underwriting agreements with other investment houses and, through the underwriting "syndicate" which results, the securities will be marketed over a wide area.

If a preliminary investigation of a proposed financing project elicits the interest of an investment banking house it may take a temporary option upon an issue of securities while it conducts a careful investigation. This detailed investigation usually is divided into three parts:

1. *Commercial Investigation*.—This part of the inquiry usually involves a study of the ownership and the management of the corporation, the location of the property, and the character of the products; the type and amount of competition faced by the company and the state of its labor conditions and public relations; an analysis of the corporation's earnings or prospective earnings, a study of the balance sheet, and an estimate of the company's credit position.

2. *Legal Investigation*.—Before an investment banking house attempts to market securities it desires to know if the company has been *legally* organized and if it is in good standing with the public authorities; whether it has good title to its various properties for the specific uses it desires to make of them; whether it has the charter, franchise, and other rights necessary for it to remain in business; and, finally, whether all the legal documents affecting the proposed issue of securities are in proper form.

3. *Engineering Examination*.—The engineering examination requires careful synthesis of engineering techniques on the one hand and economic and business principles on the other. One of the first problems is to determine the value of the property in the case of an existing corporation. Consideration must be given to replacement costs and to depreciation. A dollar value must be placed upon such intangibles as processes, patents, and goodwill.

Once the present value is estimated, attention must be given to the future. What improvements will be necessary to put the property into an efficient condition? How fast will the property depreciate in value in the future? What portion of the gross earnings will be necessary to take care of depreciation and obsolescence? Is the property economically located in respect to availability of raw material, labor, and the market for the product?

The examination must go far beyond the corporation in question. Present and possible future sources of competition must be analyzed and their probable effects weighed. Costs of competing concerns must be studied

and their prospective future situation gauged, if possible. Engineering trends and business practices must be carefully scrutinized.

The Financing of Building Construction.—From the beginning of the depression in 1929, business and government alike have agreed that the restoration of a normal degree of prosperity depends in considerable measure upon the revival of the construction industry.¹ The federal government has enacted several laws and has created a number of agencies to encourage construction of all sorts. Business firms have carried on campaigns to promote new construction and to modernize the old. The efforts to facilitate financing, both of outstanding real estate mortgages and of new construction projects, have been particularly important.

Many of the financing activities are conducted under the auspices of the Federal Home Loan Bank Board, which administers the Federal Home Loan Bank System. The powers and duties of this federal agency have been gradually extended with each successive governmental effort to stimulate new building and to assist those who already own property. The first links in the system were the twelve Federal Home Loan banks, the purpose of which was to make loans to mortgage-lending institutions, principally savings and loan associations. Next was added the HOLC (Home Owners' Loan Corporation) to refinance distressed mortgages. Legislation was enacted providing for the federal incorporation of savings and loan associations and to insure their stock, as well as the stock of eligible state-incorporated institutions.

The FHA (Federal Housing Administration), which is separate from the Federal Home Loan Bank System, guarantees mortgage loans made by mortgage-lending institutions such as approved savings and loan companies, banks, insurance companies, and mortgage companies. By establishing standards which a new construction project or a modernization plan must meet if the financing loans are to be insured, the FHA is playing a significant educational role. The FHA now (1938) insures mortgages up to 90 percent of that part of the value of a residence under \$6,000, and 80 percent of that part in excess of \$6,000.

¹ For the decline in construction from 1929 to 1933 and the lagging recovery thereafter, see Chap. XXI.

Problems

53. To what extent and by what methods do commercial banks provide purchasing power? What is "deposit currency"?

54. "A bank is required by law to pay all legal claims upon demand, yet if it were always prepared to do so it would not be able to perform the functions of a bank." Explain.

55. Suppose the Board of Governors of the Federal Reserve System desires to curtail credit expansion, just how might it employ open-market operations to attempt to accomplish its purpose?

56. If a member bank is unable to make a loan to a customer who is a good credit risk, how may it obtain help from the Federal reserve bank of its district to accommodate the customer?

57. Account for the fact that an increasing percentage of the investments of banks is in government bonds. Is this a desirable situation? Why?

58. Explain how a commercial bank with a capital of only \$100,000 may make, under certain conditions, loans in excess of \$1,000,000.

References

KEMMERER, E. W.: "The A B C of the Federal Reserve System," 10th ed., Princeton University Press, 1936.

KILBORNE, RUSSELL D., and GEORGE W. WOODWORTH: "Principles of Money and Banking," McGraw-Hill Book Company, Inc., 1937.

KNIFFIN, WILLIAM H.: "How to Use Your Bank," McGraw-Hill Book Company, Inc., 1937.

RIDDLE, N. G.: "Investment Policy of Trust Institutions," Business Publications Co., 1934.

WALKER, JOHN R.: "Bank Credit and Money," Harper & Brothers, 1937.

WHITE, HORACE: "Money and Banking," revised and enlarged by C. S. Tippetts and L. Froman, Ginn & Company, 1935.

WILLIS, H. P.: "The Theory and Practice of Central Banking," Harper & Brothers, 1936.

CHAPTER IX

PRICE TRENDS AND MONEY THEORY

The engineering student who examines the relationship of money to prices is not concerned with a mere isolated fragment of economic science. Rather he is concerned with basic processes which permeate every part of the subject and which are interrelated with all aspects of economic and business activity. The present system of economics is described as a money economy. Motivation of activity takes place largely in terms of money profit; determination of business policy runs in terms of gain or loss in money income; wealth and welfare are inextricably connected with money values. Long-range disturbances of prices and profits are a part of the money problem; the relative distribution of property and income is deeply affected by changes in the purchasing power of money; and the efficiency of the physical plant and equipment of industry is regulated by exigencies of finance.

Economic "Time Series."—The types of price fluctuations conform to the various movements of economic data which are classified as *time series*. The dominating importance of the time series is not found in any other field of statistical research, and the development of methods of analysis appropriate to time series has come only recently, with the wider adoption of statistical methods in the field of economics. Time series may be classified into four groups: Seasonal, cyclical, secular, and residual fluctuations. Seasonal movements are those which recur with some regularity every year. Thus department store sales are greatest in December and building construction reaches a peak in the summer months. Cyclical movements are composed of the repeated phases of prosperity and depression which characterize business conditions. The cycle is not exact, since a given phase of the cycle may not be an exact duplicate of the similar phase in a preceding cycle and since the length of the cycle is not uniform but may vary from three years to eight years or so, but the general course of events is sufficiently repetitive to justify

the use of the term "trade cycle" or "business cycle." Secular trend represents the long-time growth or decline in a series and usually covers a period longer than one trade cycle. Residual fluctuations, lastly, represent movements due to erratic and unusual causes such as wars, floods, or famine.

Secular Trend.—Many series of economic statistics exhibit a definite *trend* over a fairly long period of years. The trend may be either positive or negative in slope but it is to be distinguished from the trade cycle because it does not often reverse itself and because it covers a longer period of time without reversal. In the analysis of any time series the trend value at any date is taken to be the *normal* value at that date. That is to say, it is viewed as the value that would have been recorded for the given series if the effects of all accidental and complicating forces could have been eliminated.

For most types of data the secular trend may be represented by a mathematical curve. A straight line, second-degree curve, third-degree curve, or curve of a higher power may serve to represent the trend. The type of curve used depends upon many considerations, such as the nature of the analysis to be made and the available time in which to make it. One method for computing the trend, which is frequently encountered in economic analysis, is known as the method of least squares: the sum of the squares of the deviations of the actual data from the trend line is a minimum. The straight-line "normal" computed on this basis is an unreal, average, purely statistical concept even though it is a very useful one (see Fig. 8, page 161).

The Secular Trend of Prices.—In speaking of the secular trend of prices, the item under consideration is not the price of any single commodity, such as coal, copper, or corn flakes, but rather an average index number of the prices of all commodities taken as a group. By analogy, the level of the water in the Atlantic Ocean (secular trend of prices), though subject to variations in the form of waves (individual prices) and tides (business cycles), really is determined by the amount of water and the shape of the ocean bed in which it is contained. It is the fluctuations of the mean (average) level of the water that are significant here, and not the superimposed surface movements of waves and tides. In the same way the term "money" will be used in its broader sense, so as to include both currency and credit. Thus the finan-

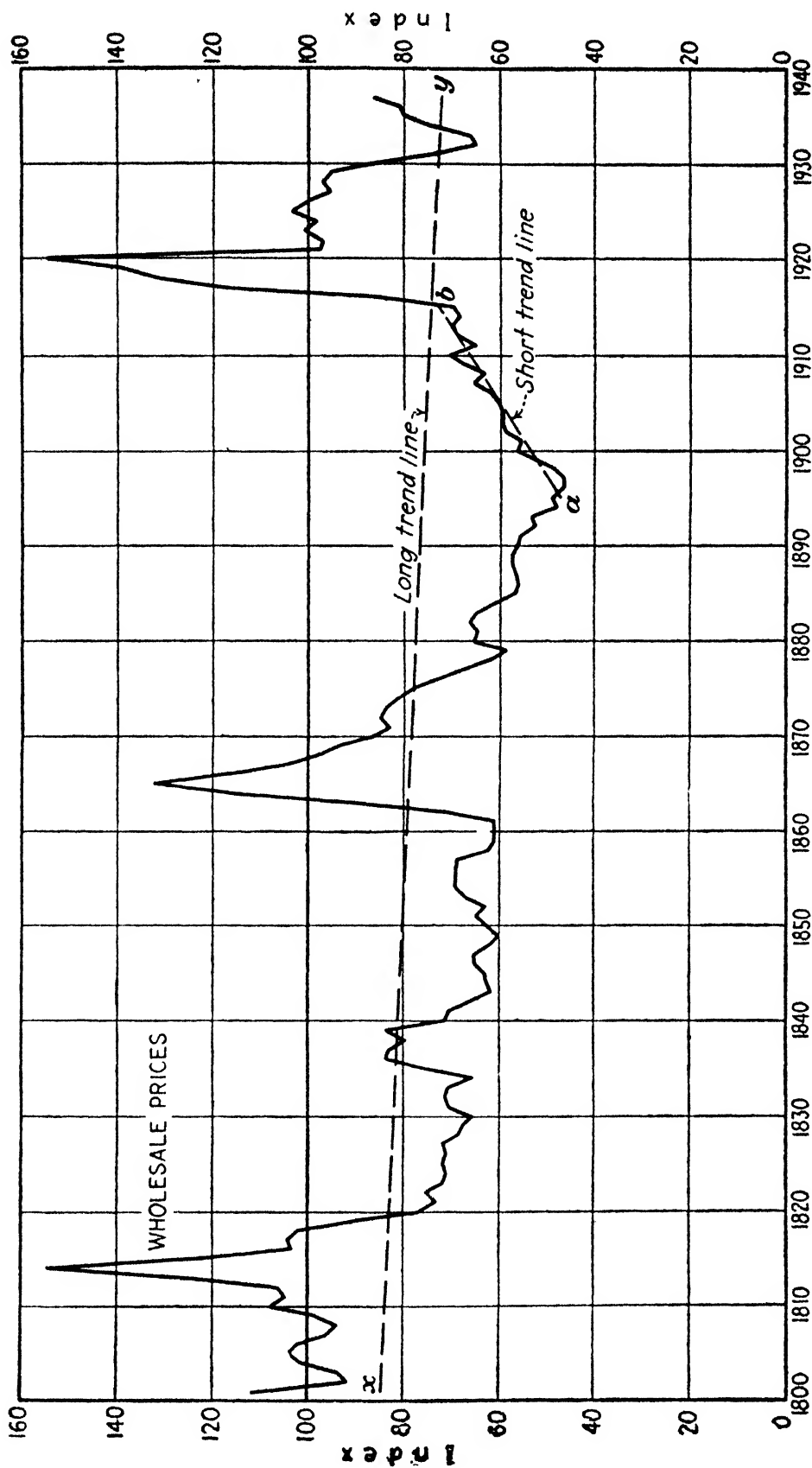


FIG. 8.—The trend of wholesale prices in the United States, 1800–1938.¹

¹ United States Bureau of Labor Statistics Bulletin 572; "Statistical Abstract of the United States," 1937.

cial system as a whole, instead of its currency phase alone, will be considered in the discussion of price levels.

A financial system that is really satisfactory should not permit violent changes in the general average of prices, though it need not prevent all movement in the price average. A slow but steady upward tendency of prices appears to be conducive to general business well-being, since it seems to keep industry somewhat better employed than does a downward trend. A slowly declining trend, on the other hand, probably provides the best means of passing on to consumers generally the advantages which accrue from new inventions and cost reductions. From this viewpoint a slowly falling trend is most desirable, but in any case violent fluctuations of prices should not appear.

The secular trend of wholesale prices in the United States is shown in Fig. 8. The high points which appeared in 1814, 1865, and 1920 indicate periods of war inflation and thus are movements classified as "residual fluctuations." The short-time variations are largely "cyclical" in nature, while the *secular trend* of prices is represented by the long swings from one period of war inflation to the next. For example, the secular trend from 1814 to 1830 was downward and involved a loss of 89 points; the trend rose 18 points to 1839; fell 22 points to 1860; fell again, after the Civil War, from 1865 to 1896 by 85 points; and rose thereafter until the World War by over 60 points. Our financial system evidently has failed to control price movements closely, for these fluctuations recur frequently in our price history and show wide variations.

The Consequences of Price Movements.—The unfavorable consequences of price movements do not result from the height of the general price level at any given time as much as from variations in the level. "Good business" can exist at one world price level about as well as at another. If prices in general advance 100 percent, consumers could buy as much at the new average as they did at the old one, provided their incomes increased at the same rate and to the same degree. If movements of the general price level affected all classes of men and all industries uniformly, they would be relatively harmless. Serious consequences arise because of the inequality of gain or loss between various economic groups. Some incomes advance while others decline; some prices rise earlier than others, or at a faster rate, or to a higher peak;

some industries adjust themselves more rapidly to price changes than do others.

Creditors and Debtors.—The purchasing power of the funds loaned by creditors increases with a falling price trend and decreases with a rising trend. The same situation exists in regard to interest payments, annuities, receipts from insurance policies, savings accounts, and other forms of investment. In all these cases, the purchasing power of the creditor's income and principal varies inversely as the general average of prices. For example, if \$1,000 had been placed in a savings account in 1896 and allowed to accumulate at compound interest, the combined interest and principal would not have purchased so large an amount of goods and services at the high prices of 1920 as the original \$1,000 would have bought in 1896. The reward for saving would have been negative.

Debtors are affected in a manner opposite to that of creditors. A rising trend is favorable and a falling trend unfavorable to their interests. If the bulk of business were done on a cash basis, these inequities would be avoided, but the essence of the present system is the conduct of business on a credit basis. Thus injustice between creditor and debtor strikes at the heart of the system. During rising prices the bondholders, other creditors, and even preferred stockholders often lose while the common stockholders gain, since the latter are the ones who participate in unusual earnings. Conversely, during falling prices the bondholders may gain while the stockholders lose.

Wages, Salaries, and Profits.—The receivers of wages and salaries suffer during a period of rising prices and gain during a period of falling prices. Wage and salary movements are more sluggish than are commodity price fluctuations. Since the latter series leads the former, *real* income shrinks on the upswing and grows on the downgrade of secular price movements if employment is maintained.

Profiteering is roundly criticized during periods of soaring prices. Lawmakers and courts try to suppress high earnings by legal coercion. Agitators insist that businessmen generally are exploiting the public, but such attacks are largely futile since they rest on the assumption that profiteering is a manifestation of unusual avarice and cupidity. Actually, the situation is generally beyond the businessman's control. During a price

advance, goods purchased at today's low prices may be sold at tomorrow's high prices. Costs lag behind prices, so these profit windfalls in reality are attributable solely to the skyrocketing general average of prices.

The Value of the Money Unit.—Changing price levels mean changes in the purchasing power of the money unit. If a unit of money buys $10X$ goods today and a year from now buys $5X$ goods, the price level has doubled, an index of average prices standing at 100 today would reach 200 a year from now, and the purchasing power of a unit of money has fallen 50 percent in the same period. Thus changes in the purchasing power of money sometimes are regarded as the reciprocals of index numbers measuring fluctuations in the price level.

The various consequences of changing price levels that have just been noted are very closely related to changes in the value of the money unit. Much of the economic literature dealing with the subject of money, and a large part of the interest in this field on the part of men of practical affairs, arise from fluctuations in the value of money. Several theories have been developed in the attempt to explain these changes in the value of the money unit.

The Quantity Theory.—Two forms of the *quantity theory* of the value of the money unit are held today. According to the strict or *mathematical* theory, a change in the amount of money in circulation (other things remaining the same) will cause an *exactly proportional* change in the general average of prices. The elastic or *psychological* theory, on the other hand, states that the relationship between money and prices is not exactly proportional, though the direction of movement is similar. The mathematical theory may be expressed by the following equation:

$$P = \frac{MV + M'V'}{T} \quad (6)$$

where P = general index of prices.

M = coin and paper money in circulation.

V = velocity of circulation of money (total volume of money payments in a given period divided by the number of pieces of money in circulation).

M' = demand deposits in banks (checking accounts).

V' = velocity of circulation of deposits (total volume of check payments, or bank debits, in a given period divided by the average number of dollars of deposits).

T = volume of trade in the period.

When defined in this way, the equation is merely a truism. It simply states that the total amount of money spent ($MV + M'V'$) in a given period must be equal to the total value of the goods and services (PT) purchased with that money in the same period. A truism, however, may be an indispensable instrument of research. The problem is one of "causation"—what causes changes in P ? To phrase it another way, does some one item in the equation change first so that a change in P is required to preserve equality, or do several items change simultaneously owing to a common cause? Answers to these questions will determine the type of control that may be exercised in an attempt to maintain a stable price average.

The Elastic Quantity Theory.—Efforts have been made to prove or disprove the mathematical quantity theory statistically, but they have been inconclusive since the same facts also may be explained by other theories. One point, however, is significant. The quantity theory says that if trade volume T is unaltered, the price level P cannot change unless money M , credit M' , or their rates of turnover V , V' , change first. This statement sometimes runs counter to known facts. Prices may rise or fall before the other factors change. On the other hand, money may undergo considerable change, but all the other factors may remain unaltered for a time. The mathematical quantity theory, therefore, does not give a conclusive explanation of all changes in the value of the money unit.

The elastic or psychological quantity theory might be stated in the following form:

$$P = f\left(\frac{MV + M'V'}{T}\right) \quad (7)$$

There is little doubt that a marked increase in trade (T) without a concurrent increase in money would lead to a reduction in the price level. Indeed, this change apparently accounts for the falling wholesale price level in the period from 1865 to 1896. On the other hand, a marked increase in money *in use* generally leads to higher prices if trade does not expand at the same rate. Gold strikes in California in 1848 and in Alaska in 1898 thus may be related to secular upward trends of prices in succeeding years. Speaking generally, then, we may say that

$$\frac{\text{Quantity of money in use}}{\text{Volume of goods sold}} = \text{price level}, \quad (8)$$

although many exceptions to this generalization are recognized and admitted. Some authorities feel that a statement should be reached which has no exceptions; thus they have suggested other hypotheses intended to supplant the quantity theory.

The Commodity Theory.—In contrast to the quantity theory of money value, which treats all forms of money in circulation alike and gives attention only to the *volume* of money and of goods present in the market, is the so-called *commodity* theory which places its emphasis upon one form of money above all others and considers the *value* of this money and the value of the goods present in the market, in an attempt to explain the price level. According to this theory, paper money and credit get their values from gold. Since gold thus is basic in all valuations, prices represent the value of goods in terms of the standard money, gold. The quantity of currency and credit used at any time is determined by the price level in relation to the amount of business to be done. The pricing process would be represented thus:

$$\frac{\text{Value of goods}}{\text{Value of standard money unit}} = \text{price level.} \quad (9)$$

According to the commodity theory, the stability of the money standard results from the relatively small annual additions made to the world's stock of gold. The commodity theory emphasizes the point, undoubtedly true in many cases, that the quantity of currency and credit in use at any time is a result, rather than a cause, of the price level. When prices are high more pocket money and bank deposits are needed to buy goods than when prices are low. However, valuation of goods in terms of the value of the gold unit is an artificial explanation. The process certainly is not representative of conditions in the United States, for gold seldom was seen in circulation before the gold standard was altered. Furthermore, the value of money does not seem to be inherent in gold alone but appears to exist in the entire money system. Thus the commodity theory also fails to account for all the facts.

Money as a Basic Institution.—An *institution* viewed in the larger sense is composed of (1) an idea, (2) a structure built upon this idea, together with its immediate sponsors and supporters, and (3) sanction by the general public. Thus the institution of religion, for example, is something much larger and less clearly

defined than the churches or the clergy that are its outward manifestations. In the same way, the institution of money is something more than the mere physical items of coin, paper money, checks, and banking centers. Our money institution rests upon the habits and customs of the people who utilize the money system.

The value of money, then, is not solely the result of the quantity of money in circulation, nor is it determined by the value of the standard unit alone. It is partly a matter of social habit and custom. *The value of the money unit, gold equally with paper, thus comes from the whole institutional money system.* The leading monetary item seems to be credit and not currency; and financial and credit policy are more important for purposes of control than is gold or currency.¹

The institutional theory of money value may be stated thus:

Business estimates → Expenditures → Money in use → Price level.

In other words, industrial activity depends upon businessmen's estimates of *future* profit possibilities. If the estimates indicate that expansion will be profitable, businessmen increase their expenditures. Thus additional funds are required in the form of currency and bank credit; in this way the volume of money *in use* is increased. As a result, the price level is likely to rise. A businessman's determination to expand operations, however, is related to the stability of the money system, and a gold standard is thought by many persons to be a safer basis for business expansion than is a paper standard. Hence the institutional theory appropriates those portions of the quantity and commodity theories which seem to meet the test of facts, and seeks to develop an explanation of price levels which appears to be in agreement with actual experience.

Purposes of Financial Control.—Knowledge of just what financial control proposes to accomplish is necessary, for the control of finance may be advocated by different persons with a view to the attainment of a variety of ends. Action in any case must proceed from the central banking system or from the United States Treasury, for individual banks organized purely on a

¹ For the institutional treatment of money value, the authors are indebted to an unpublished work by Dr. C. A. Dice, professor of banking, Ohio State University.

profit-making basis are unlikely to exert their efforts to any great extent toward ends that are non-profit making. The main objectives of the various proposals for financial control are three in number.

Of a purely banking nature is the desire to maintain a *sound banking structure*. Such control may be exercised to no small degree by the central banking system of a country. This organization is in a very responsible position, since it holds the ultimate reserves that are essential to a sound banking situation in the nation as a whole. Another aim of control is the *prevention of overexpansion*. Once labor and other primary factors of production are fully employed, additional expansion of currency and credit can result only in the bidding up of the prices of these factors without any significant increase in the production or distribution of goods; this activity leads to dangerous financial overexpansion. The third objective advocates the use of the banking machinery to *control the general average of prices*. In this instance control means stabilization, not stagnation; it is the rate of movement that is to be restricted, not the opportunity for movements of any sort.

Devices to Control the Price Level.—Many plans have been devised for the control of the price level. The United States has relied upon the gold standard for a sound currency and upon the Federal Reserve System for a sound banking policy. Although the gold standard works well in periods of prosperity and business stability, it frequently collapses during periods of economic strain. As a result, a number of substitutes have been proposed. Since 1931, most of the countries of the world have abandoned the gold standard and have substituted for it some form of managed currency. Opinion has been divided as to the aim of currency management and the type of monetary system best suited to management. No unanimity of opinion has been reached as yet on either of these questions. Proposals for monetary systems range from irredeemable paper money with no required gold backing on one hand to the prewar gold standard on the other. Proposals for policies of currency management include those advocating a steadily declining price level, a gradually rising price level, and price level stabilization. At the present time, the Federal Reserve System plays the most important role in the monetary policies of the United States.

Federal Reserve Policies.—There have always been differences of opinion as to the scope of the control activities of the Federal Reserve System. Throughout the first half of 1929, when stock-market loans were increasing by millions of dollars daily, numerous magazine articles and newspaper editorials attempted to advise the Federal Reserve Board.¹ Depending upon the adviser, the board was asked to “control prices,” “stabilize business,” “prevent speculation,” “regulate credit,” “meet the legitimate needs of commerce and industry,” and many other things. It was generally, though not unanimously, agreed that the Federal Reserve System had greatly improved the elasticity of the currency and the method of keeping reserves, that it had provided a valuable clearing and collection agency, that it had made possible a discount market, and that in general it had exerted a steadying influence upon the country’s finances, particularly during the war and the period of readjustment immediately following. The exact status of the system as a means of financial control, however, still remained an undefined though widely discussed subject.

Regardless of differences of opinion in respect to the control activities of central banking institutions, the fact remains that the type of control exercised must depend upon the facilities of the controlling agency. The credit-regulating activities of the Federal Reserve System thus are significant, for if the system exerts any influence upon prices, business, speculation, and so on, it does so through its power either to regulate bank credit directly or to give warnings in respect to the general situation. In addition to their occasional *warnings*, the psychological effects of which may be significant, the board and the reserve banks use *rediscounting*, *open-market operations*, and *variations in reserve requirements* as tools of credit control. These tools were explained in Chap. VIII.

Price control through the agency of the central banking system may be attempted in regard to the secular trend, to cyclical fluctuations, or to both movements. In each case there are certain limitations to adequate price control. The most important limitation upon stabilization of the *secular trend* of prices arises from the very nature of a gold standard. Gold reserves are

¹ Since replaced by the Board of Governors of the Federal Reserve System.

restricted by the rate at which the metal is mined, so that, if a shortage of gold occurs, a lowering of the rediscount rate may not restrain indefinitely the tendency toward falling prices. Hence price stabilization policies ultimately may require the modification of a given gold standard.

The outstanding limitation upon financial control of *cyclical* price movements is to be found in the changing conditions of demand for bank credit at different phases of the cycle. During the boom period, borrowers may be so confident of continued prosperity and high profits that they will increase their borrowings progressively in spite of rising interest rates. Conversely, when confronted with a drastic slump of trade, businessmen refuse to borrow no matter how low the rate of interest may be reduced. Thus any attempt at financial control must take place some time prior to the inauguration of either of these phases of business activity in the effort to prevent their occurrence. Timeliness is all-important where efforts at cyclical control through credit policy are concerned.

A Managed Currency.—The noted English economist, J. M. Keynes,¹ was one of the first to suggest the use of a managed currency in place of the gold standard. Not only is gold unstable in purchasing power, but also all issues of money and expansion of credit are limited by the necessity for ultimate gold reserves. Thus if gold is exported and a shortage appears, as has been true of many countries since the war, the amount of currency and credit that can be used may be greatly restricted. Because the supply of money and credit is not related solely to the quantity of trade, prices may fluctuate so as vitally to affect business prosperity. The *managed currency* proposal is an attempt to relate the supply of money and credit to the needs of trade rather than to the unstable and expensive gold standard.

Under a managed currency, the gold limits of the gold standard are set aside. The circulating medium consists of irredeemable paper money. This proposal rests upon the quantity theory of money, because it assumes that if the quantity of the paper money is restricted, its value can be kept at the desired level. Domestic prices would be stabilized by the simultaneous

¹ KEYNES, J. M.: "Monetary Reform," Harcourt, Brace & Company, 1924.

control of (1) the quantity of paper money in circulation, (2) the rediscount rate, (3) open-market transactions, and (4) the fiscal policies of the Treasury.

The managed currency proposal has met with a number of criticisms. The first is that it rests upon the quantity theory of money. Some economists who object to a strict interpretation of the quantity theory believe that a currency cannot always be managed. They contend that the chain of causation is not from the quantity of money to prices to business activity, but in some other order. Prices sometimes vary in spite of bank rates, open-market operations, Treasury policy, and the quantity of money in circulation. Second, the proposal introduces grave dangers of mismanagement, even if it were unquestionably feasible on theoretical grounds. A managed currency requires a manager. If he is a politician, it is possible that price manipulation will be used as a means of securing votes. If he is not a politician, there is still the difficulty of finding a manager capable of handling the job. A third criticism is that it would be difficult to set up a price index which would be satisfactory. Certain commodity prices would have to be included in the construction of the index, and there would be considerable debate as to which these should be. There would also be differences of opinion as to the weights to be assigned to the various commodities in the construction of the index.

"100 Percent Money."—The banking crisis of 1933 and its attendant consequences brought a number of proposals for the reform of our currency and banking system. One of the most widely discussed of these proposals was that for 100 percent reserves behind all bank deposits. Although there are a number of variations of this plan, the general proposal is that the government should buy the stock of the Federal reserve banks, and require all commercial banks to join the Federal Reserve System and to maintain reserves of 100 percent against their demand deposits. The commercial banks would secure funds for this reserve by selling enough of their earning assets to the government to bring their cash holdings up to at least 100 percent of their demand deposits. Such a system obviously would limit the ability of the banks to extend credit to the actual amount saved, *i.e.*, to time deposits. Little or no reserve would be

required for time deposits under the 100 percent reserve plan. Any expansion or contraction of credit would come from expansion or contraction of the government's note issue.

Such a proposal would give the government the greatest possible control over the volume of money and credit, since the two would be the same (government notes). The 100 percent reserve proposal is essentially the managed currency proposal carried to its logical extreme, and as such it is open to the same general criticisms.

The Production and Distribution of Gold.—About 85 percent of the world's gold production since the discovery of America occurred after 1850.¹ The development of new gold deposits, principally those in South Africa (after 1887), multiplied the annual output of gold about twenty times. With the coming of the world economic depression there occurred a "scramble for gold" which further increased the output. When the United States government in 1933 raised the official gold price from \$20.67 to \$35 an ounce, and several other countries pursued similar

TABLE 9.—WORLD'S GOLD PRODUCTION*
Outside U.S.S.R.

Year	Ounces, millions	Value, thousands of dollars
An ounce of fine gold = \$20.67		
1927	18 3	378,262
1928	18.5	382,532
1929	18.5	382,532
1930	19 4	401,088
1931	20.6	426,424
1932	22.1	458,102
1933	22 7	469,257
An ounce of fine gold = \$35		
1933	22.7	794,498
1934	23 5	823,000
1935	25.2	882,533
1936	27.7	970,206
1937	29.9	1,045,470

* Data for 1927 and 1928 obtained from the Statistical Year-Book of the League of Nations (1933-1934); from 1929 to 1937, from the *Federal Reserve Bulletin*, April, 1938.

¹ KEMMERER, EDWIN W.: "Money," The Macmillan Company, 1935, p. 79.

policies, the output as measured in ounces again increased but, after the revaluation of gold, not nearly so fast as the value of gold production expressed in dollars.

The United States now holds over 60 percent of the world's monetary gold stock. The remaining 40 percent is very unequally distributed. For example, Germany, Italy, and Japan together hold less than 1 percent of the world's monetary gold supply. These facts have an important bearing upon the monetary policies of the several countries, particularly in respect to the future of gold standards.

The annual rate of gold production, together with its international distribution, plays a part in the determination of the price level *if* countries are operating upon a gold basis. Even if some countries are not on a gold basis their price levels will be influenced to some extent by those countries which still adhere to gold. But it should be carefully noted that the gold standard is itself a variable standard, and more or less gold is required to maintain such a standard, depending upon the government's monetary policies. In other words, a given amount of gold can be made to do more or less work in the money system depending upon the dollar valuation placed upon a given quantity (by weight) of gold. A country which can adopt a "59-cent" dollar and still remain upon a *modified* gold standard could adopt a "79-cent" dollar or a "29-cent" dollar.

Inflation and Deflation.—Largely as a result of the World War experience of several European countries, the term "inflation" has come to be synonymous with a currency of little or no value, hence inflation is something to be avoided at all costs. From the economic standpoint, inflation may be defined as an increase in the currency or credit sufficiently large to bring about a quick and marked rise in prices. Deflation, on the other hand, usually is thought of merely as a decline in prices, although the decline conceivably might extend nearly to the vanishing point. Theoretically deflation and inflation may have different but equally serious effects.

Inflation invariably is the result of distorted economic conditions which frequently are associated with the raising of huge funds for war purposes or with the inability of governments to finance themselves by taxation during the period following a war. In every depression period there is a demand for inflationary

measures as a means of restoring prosperity. When depression has gone so far as to interfere seriously with the orderly operation of the economic system, a restoration of prices (reflation) becomes advisable, but there remains the important question of how it shall be done. Price restoration by inflationary means is feared by many persons because rapid inflation, once initiated, may not be subject to control and so may go further than was anticipated. This is one reason why the inflationary aspects of New Deal policies have been so vigorously opposed and why a slower, more painful, but more "normal" recovery of prices and trade is desired by some groups in our economic system.

Problems

59. Assuming that the secular trend of prices is upward during the next 20 years, how would the following economic groups probably be affected: Bondholders? Stockholders? Salary receivers? Home owners?

60. If chemists are successful in producing gold from mercury by altering the number of electrons per atom of mercury, what will be the probable effect on our money and price system?

61. The suggestion has been made that government and corporate bonds contain a clause requiring interest and principal to be paid in terms of constant purchasing power instead of a fixed number of dollars. Do you consider the plan advisable? Why? Would it have any effect upon proposed monetary reforms? Why?

62. "Other factors in the equation $P = \frac{MV + M'V'}{T}$ remaining the same:

- a. The quantity of money varies directly as the price level.
- b. The quantity of money varies inversely as the velocity.
- c. The quantity of money varies directly as the volume of goods transferred by money."

Would a quantity theorist agree to these conclusions? Does the equation warrant the drawing of these conclusions?

63. "It is possible to have inflation without deflation and deflation without inflation, and it is possible for inflation to precede deflation or for deflation to precede inflation." Explain.

64. "The only way to control a rising federal debt, when there appears to be little likelihood of balancing the budget, is to inflate prices generally. The debt at any given time is a fixed number of dollars and it can be made *relatively* smaller by raising the prices of other things." Is this proposed policy advisable?

65. "As long as the government keeps 100 cents in the dollar no one needs to fear inflation." Explain.

66. Suppose Congress should change the price of gold from \$35 to \$25 an ounce, who would gain? Who would lose? Why? If this change were

made would a mining engineer earning \$300 a month be better or worse off? Why?

67. What do you understand by a "commodity" dollar? Is it the same thing as a "managed" currency? Why?

68. "Business can function as well at one price level as at another; the difficulty is in the transition from one level to another." Explain the difficulty. Under what conditions may the difficulty prove to be an advantage?

69. Is the size of the federal debt likely to have any effect upon the purchasing power of money at some future time?

References

ANDERSON, B. M., JR.: "The Value of Money," rev. ed., The Macmillan Company, 1926.

BECKHART, BENJAMIN H., and others: "The New York Money Market," Columbia University Press, 1932.

CLARK, LAWRENCE E.: "Central Banking under the Federal Reserve System," The Macmillan Company, 1935.

FISHER, IRVING: "100 % Money," Adelphia Company, 1935.

GOODBAR, J. E.: "Managing the People's Money," Yale University Press, 1935.

LEFFLER, RAY V.: "Money and Credit," Harper & Brothers, 1935.

PASVOLSKY, LEO: "Current Monetary Issues," Brookings Institution, 1933.

REED, HAROLD L.: "The Commodity Dollar," Farrar & Rinehart, Inc., 1934.

WARREN, G. F., and F. A. PEARSON: "Gold and Prices," John Wiley & Sons, Inc., 1935.

CHAPTER X

INTERNATIONAL TRADE AND FINANCE . . . . .	176

There is much confusion of thought regarding the role of international trade in the activity of a nation. In fact, the foreign trade of the United States often is considered a mere extra-curricular activity of significance only to a few groups in the economy. Yet the truth of the matter is that the exchange of goods and services between countries, as well as the control over such transactions, has effects which penetrate the innermost recesses of any highly specialized nation. The continual conflict for raw materials and for markets is sufficient evidence to show the importance attached to international economic relations by both businessmen and politicians. The advantages of specialization and large-scale machine production are limited by the size of the market for the goods so produced, and the size of the market is decreased by barriers to both domestic and international trade.

I. CHARACTERISTICS OF INTERNATIONAL TRADE

Differences in Prices.—It should be kept in mind that international trade refers mainly to the exchange of goods and services between persons in different nations rather than between the national governments themselves. It is the General Motors Corporation which sells a Buick to a native of England, for instance, and not the United States Government which sells such merchandise to the British Empire. Occasionally, of course, the agents of a government will purchase certain items, such as munitions, from companies in other countries, but the majority of the trade crossing national boundaries is carried on by individuals or corporations in the respective countries.

With a few exceptions, arising out of the desire for conspicuous consumption or the prejudice of patriotism, international trade is carried on because of differences in prices for the same or similar commodities or services in the different countries. The profit motive prompts the businessman to buy his raw materials or

finished goods in some other country if he can purchase them for less than the price he must pay in his own country. Some items, such as specific artistic or exotic goods and particular natural resources, are purchased outside the country because they are not available within its borders. However, even such things as rubber, coffee, and silk, of which we import large quantities, could be produced under controlled conditions in the United States, but costs of production and prices would be much higher than they are now. Thus the first principle of international trade is that international buying and selling are directed by *differences in prices* for the same or similar goods in different countries.

Foreign Trade vs. Domestic Trade.—If it be merely a matter of differences in prices in different countries that characterizes trade between the American and the foreigner, we may reasonably ask ourselves how foreign trade differs from domestic trade. Surely trade between people in Ohio and Pennsylvania, for instance, or even between producers and consumers in our home city or town, also is directed largely by price differentials. Yet there would be no excuse for the special attention given to foreign trade if there were not special problems and features that are not entirely explained by an analysis of domestic trade. The difference hardly lies in the matter of transportation costs, for we find that the transportation cost between New York and San Francisco (domestic trade) is greater than between New York and Montreal (foreign trade). Could it be that the factors of production are immobile between countries? Certainly we find immobility in varying degrees within the country, but in addition we find capital, labor, management, and resources moving back and forth across national boundaries. However, there *are* differences between domestic and foreign trade and they arise out of the following institutional factors: (1) man-made trade barriers, such as tariff duties, quotas, and export prohibitions, (2) dissimilar currencies or standard monies; and (3) sentimental prejudices which cause nationals to favor goods made in their own country. Of course, many of these are differences in degree rather than absolute differences, but the combination of all of them is sufficient to set foreign trade off as being distinct from domestic trade.

Content of Foreign Trade of the United States.—In spite of these obstacles to trade there are important variations in prices,

for the same or similar products, when one country is compared with another, because of either differences in costs of production or differences in the amount or character of the competition in the respective countries. Thus we find that many people in other countries make their living by producing and selling to us goods that help us to maintain the efficient operation of our industries, as well as to raise the standard of living of consumers in this country. Similarly, many people in the United States hire labor and buy raw materials to produce articles that will be used by the producers and consumers in foreign countries. Tables 10 and 11 show the nature and relative importance of some of the goods we buy from others as well as those goods which foreigners can buy here at prices lower than they can purchase the goods elsewhere.

TABLE 10.—UNITED STATES EXPORTS AND IMPORTS*
(In Millions of Dollars)

Year	1930	1931	1932	1933	1934	1935	1936
Exports:							
Crude materials.....	\$ 829	\$ 566	\$ 513	\$ 590	\$ 652	\$ 682	\$ 668
Crude foodstuffs	178	127	89	48	59	58	58
Manufactured foodstuffs ..	362	246	152	154	167	157	143
Semi-manufactured goods.....	512	317	196	237	341	349	394
Manufactured goods....	1,898	1,119	624	616	878	994	1,152
Total.....	3,781	2,377	1,576	1,647	2,100	2,243	2,416
Imports:							
Crude materials.....	1,002	642	358	418	460	582	733
Crude foodstuffs.....	400	304	232	215	254	322	348
Manufactured foodstuffs ..	293	222	173	201	263	318	383
Semi-manufactured goods.....	608	372	216	292	307	409	490
Manufactured goods	757	549	340	322	350	405	465
Total.....	3,060	2,090	1,322	1,449	1,636	2,037	2,421

* Statistical Abstract of the United States, p. 442, 1937.

The information presented in Table 11 gives us some idea of the type of commodities which the people of the United States ship across their boundaries. Raw materials, both foodstuffs and non-foodstuffs, are the type of commodity most imported. Four of the five leading imports are commodities which the United States is not able to produce economically at the present time. The chief individual exports are not manufactured or finished commodities, in spite of the fact that the United States

**TABLE 11.—UNITED STATES LEADING IMPORT AND EXPORT COMMODITIES
AND COUNTRIES*
1930-1937 Average**

Commodities		Countries	
Export	Import	Export	Import
Cotton, unmanufactured	Coffee	United Kingdom	Canada
Petroleum and its products	Raw silk	Canada	Japan
Machinery, all classes	Sugar	Japan	United Kingdom
Automobiles, incorporated engines	Paper and paper products	Germany	British Malaya
Tobacco, unmanufactured	Crude rubber	France	Germany

* "Statistical Abstract of the United States."

is one of the leading industrial nations. Of the first five exports, three are classed as raw materials, *i.e.*, cotton, petroleum, and tobacco. We find a partial explanation of this feature of international trade when we observe the tariffs imposed by most nations against the importation of manufactured goods, and when we realize that the production of manufactured goods is less restricted by climate, quality of soil, and other local conditions, than is the production of raw materials.

The United States Balance of Payments.—Imports and exports of goods do not represent the whole of our foreign commerce. In addition to the commodities—raw, semi-processed and processed—numerous so-called "invisible" items are bought and sold. These "invisible" elements in trade are largely services and capital investments. Americans employ the services of foreign ships, foreign insurance companies, and foreign banks in the movement of goods in much the same way that they use the services of foreign hotels, railroads, and restaurants when they travel abroad. Likewise, foreigners purchase similar services from people in the United States.

A complete picture of the exports and imports of the United States would show not only the commodity trade referred to in Table 11, but also would include the value of the services and

investments involved in American trade with the world. Historically, and even now, it has been considered a desirable condition if a country could obtain an excess of exports of goods over imports of goods (except gold). Such a condition is called a "favorable" balance of trade. The opposite condition is called an "unfavorable" balance of trade. Actually there is nothing particularly favorable or unfavorable about the form which the balance of trade takes so far as goods are concerned, *except in*

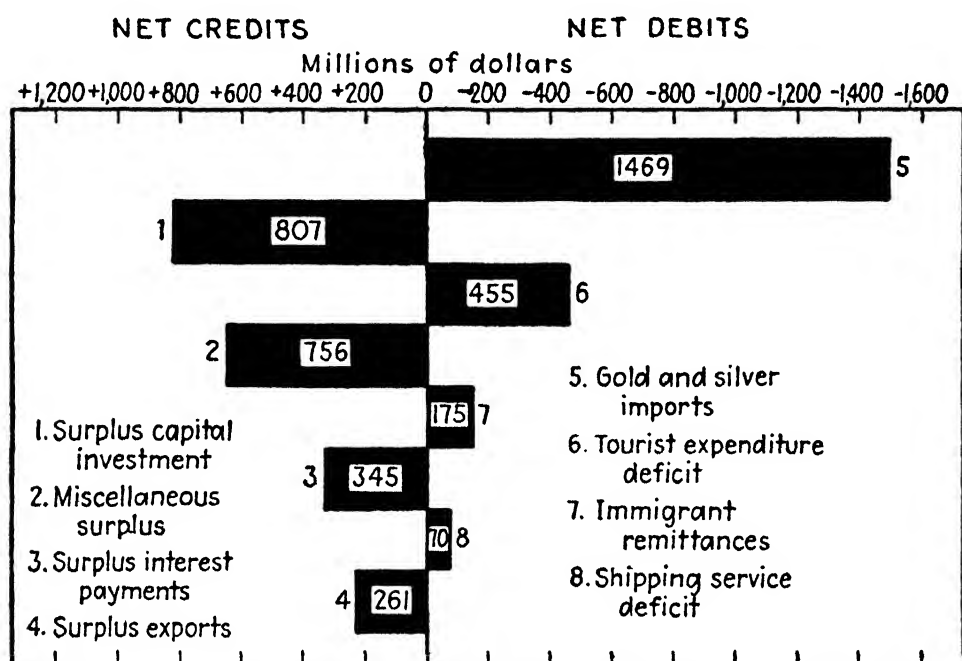


FIG. 9.—Selected items in the balance of international payments of the United States, 1937.¹

connection with the creditor or debtor condition of the country concerned. If a creditor country, such as the United States at the present time, wishes to have her debts paid to her, it is necessary that imports be allowed easy entrance so that the debt can be paid.² Under such circumstances it is more desirable to have an "unfavorable" balance of trade. On the other hand, a debtor nation will find foreign money available with which to pay foreign debts only when the debtor country can obtain an excess of exports over imports (less canceled notes).

Imports for War Purposes.—A few years ago the War Department of the United States listed thirty different materials which

¹ Bureau of Foreign and Domestic Commerce.

² Cf. pp. 190 and 191.

this country would need in case of war. Only a small number of these materials are produced within our boundaries, and in amounts not sufficient for peacetime requirements. The list includes:

antimony	hemp	manila fiber	potassium salts	sodium nitrate
camphor	hides	mica	quicksilver	sugar
chromium	iodine	nickel	quinine	tin
coffee	jute	nux vomica	rubber	tungsten
cork	flaxseed	opium	shellac	vanadium
graphite	manganese	platinum	silk	wool

II. FOREIGN TRADE PAYMENTS

Payment for Foreign Trade.—At this point our picture of the foreign trade of the United States should have some detail, some material content. Instead of visualizing two indistinct streams of goods, one flowing from the harbors of New York, New Orleans, or San Francisco to harbors in other parts of the world, and the other flowing from these foreign harbors to the American ports, we can now identify definite raw materials, semi-finished and finished goods, services, and investments as being component parts of these respective streams. Indeed, there is a direct correlation between the volume of the flow into each country with the flow out of that country. In other words, the exports of the United States over a period of time tend to equal the imports into the United States. If there is to be equality between the value of the exports and the value of the imports, however, we must include the trade in services, credit, and gold as well as the trade in goods. To make this important principle of foreign trade clear it is necessary to keep in mind the fact that businessmen in the United States, for instance, do not wish to give their goods away. If they do not give the goods to foreigners, then they must import something of value equal to the value of the exports. This statement does not mean that the exporter himself must import goods, but he must obtain the purchasing power from the foreigner in some fashion, and usually he wants payment in American money.

There are a number of ways in which the American businessman may wish to use this purchasing power received from the export of goods and services. He may, of course, turn it over to his agent in the foreign country to spend on some goods which

he wishes to import; he may wish to invest it in stocks or bonds in the foreign country with the intention of importing the securities; he may go abroad and spend it on services for himself; or he may allow it to remain in the foreign bank to his credit. There are other possibilities, such as to import it in the form of gold or to use it to pay interest on a debt which he may have incurred abroad. Yet in each case the export of these goods from the United States has created a claim abroad which cannot be realized by the exporter until the existence of an actual or potential import of goods or services is assured.

People in the United States as a group cannot expect to sell any more to foreign purchasers than they buy from them. At first thought, one might ask why we do not require the foreigner to pay in terms of his money instead of in goods. If one has had any experience attempting to spend Canadian dimes or Mexican pesos in New York City, however, one quickly dismisses this possibility from his mind. We do not want foreign money. We want dollars or gold. It is because gold is so limited in quantity that it is necessary for most payments to be made in some other medium. Therefore the foreign exchange mechanism is so arranged that, if there are exports and imports of goods and services between countries, the Frenchman can be paid in francs, the Englishman in pounds, and the American in dollars. Let us see how this result is accomplished.

The Mechanism of Foreign Trade.—Many parties are involved in each transaction between residents of two countries, *i.e.*, the exporter, the importer, the American bank, the foreign bank, and various brokers, insurance agents, and shipping companies. Of these many participants in a transaction involving foreign trade, the exporter and the importer are the principals while the other parties act as their agents. What is the role of these different actors in this international drama? Suppose that the Buick car referred to in an early part of this chapter was sold by the General Motors Company to a Mr. Doe-Roe of London, England. Mr. D-R has some cash in his pocket and a bank account in Midland, Ltd., all in pounds and shillings. The General Motors Corporation wants dollars and cents with which to pay wages, buy materials, and declare dividends. The corporation, having placed the car on board ship and received the insurance and shipping documents as evidence of this act, may take these documents and a

bill of exchange to the Chase National Bank in New York City. A bill of exchange is merely a credit instrument, signed by one party, which states that a second party will pay a third party a certain sum of money at a certain time. Bills of exchange may be payable either at sight or after a stated time. The bank will buy the bill from the General Motors Corporation and credit the latter with the amount of the sale less discount. Thus General Motors is paid in dollars.

The Chase National Bank will then dispatch these documents to an English bank and the English bank will collect from the importer, who then can present the documents to the shipping company and receive his car. So far the American bank has paid out the amount of the sale, while the English bank has collected that amount. The final step in this transaction is for the English bank to credit this amount to the account of the American bank. Now the American bank has a credit in pounds sterling abroad which it is willing to sell to someone who wishes to buy goods or services in England and who must pay for them in the currency of the United Kingdom.

Transactions of this nature occur in both countries and so banks in each country build up claims against banks in the other country. Hence an American importer can pay for some English worsted by going to an American bank which has such a credit abroad and buying a portion of it to be turned over to the English exporter. This portion which the American buys is in the form of a bank draft or the bank's check on its foreign account. Upon receipt of this draft the Englishman can take it to his bank and obtain pounds sterling for it. Then the English bank deducts that amount from the American bank's account there.

Sources of Banks' Foreign Accounts.—At any given time individuals in the United States will have monetary claims upon people in other countries and foreigners, on the other hand, will have claims upon people in the United States. These claims may arise from a number of different transactions. The American claims abroad might arise from (1) the sale of goods and services to foreigners; (2) interest and dividends receivable on foreign securities; (3) rents and royalties receivable for the use of American property by foreigners; (4) gifts and loans made by foreigners to Americans. The foreign claims in the United States might arise from any or all of these transactions if they were reversed,

i.e., interest and dividends payable on American securities held by foreigners, and so forth. Banks and other dealers in these foreign credits act as coordinating agents to allow importers and exporters in each country either to buy or to sell such claims in their own currency.

Although we have observed that the exports and imports (as well as their resultant claims) tend to equalize over a period of time, there is no reason why they should be exactly equal at one point of time. In fact it would be amazing if they were exactly equal, for that would mean that the amounts of matured claims on Americans and on foreigners at ten o'clock today would happen to be identical.

Rate of Exchange.—The medium of exchange in foreign trade is not gold, or cash, but bank drafts and commercial bills of exchange. The price paid or received for these drafts is known as the *rate of exchange*. In brief, the price that a large New York bank charges for a portion of its English pounds in the English bank is the rate of exchange on England or the rate on sterling. From the Englishman's point of view, on the other hand, the number of dollars that he can get for a pound is the rate of dollar exchange. For example, if an Englishman has to pay for a shipment of machine tools from Remington Rand billed at \$10,000, the rate of exchange will tell him how many of his pounds he will have to give to his bank to complete the transaction. If the rate of exchange is \$4, then it will require £2,500 to make the payment. If the rate is \$5, it will take only £2,000.

What determines this rate of exchange? It is simply a problem in the determination of price under competitive conditions.¹ Let us look at it from the point of view of the American. Any transaction in the nature of an export, such as the sale of goods or services, or the payment of interest or principal of a debt by a foreigner creates a supply of foreign exchange (claims or credits of the American bank deposited in the foreign bank). Anything in the nature of an import acts as a demand by the American, who must buy foreign exchange to pay the foreigner. Any increase in the American banks' supply of credits abroad will lower the rate of exchange since the banks will be eager to sell some of their large unused supply. Any increase in demand for

¹ Competition is so nearly perfect that a difference of $\frac{1}{100}$ of a cent between two markets will be adjusted almost immediately.

these foreign monies will raise the rate of exchange, since the banks' supply is becoming relatively scarce. Picture, then, a constantly moving situation in which transactions between Americans and Englishmen, for example, originate claims on foreign money and counterclaims on American money. When the claims on foreign money for exports from the United States increase more rapidly than the foreign claims on American money for imports, the rate of exchange will fall. This decline in the price of the pound in terms of dollars may encourage Americans to spend more dollars on pounds and thus increase our imports from the United Kingdom. The resultant increase in imports would increase Englishmen's claims on dollars and decrease our claims on pounds, and eventually would send the pound exchange back up again.

Limitations on Exchange Fluctuations.—If two trading countries are both on a gold standard which allows for the free movement of gold across international boundaries, the rate of exchange will fluctuate only between quite narrow limits. In such a case there will be a definite *par* of exchange, which is simply a ratio between the amounts of gold in the two standard monies. If the English pound were equal to five times as much gold as the American dollar, then the par of exchange would be \$5. This par would not necessarily be the rate of exchange at any particular time, but the rate of exchange would be limited in its fluctuations about this par. Since businessmen contrive to pay their debts in the least expensive way, they will pay with bank drafts when bank drafts are cheaper than gold and they will ship gold when gold is cheaper than drafts. Thus the cost of shipping gold will set the limits to the fluctuation of the rate of exchange. If, for instance, the American importer wanted to pay for an import of antimony worth £100,000, he could make the payment either by purchasing and shipping gold (price of gold plus insurance and freight) or he could buy bank drafts at the going rate of exchange. Thus when the rate of exchange is higher than par plus the cost of shipping gold, gold will be exported, and when the rate is lower than par minus the cost of shipping gold, gold will be imported. As soon as the exporting point is reached and importers turn to the use of gold, however, the demand for foreign exchange falls off and the rate of exchange moves back once more to par. Therefore little gold is used in payment, even when two countries are

on gold standards, and the supply and demand for foreign exchange determine the actual rate of exchange within the *shipping-cost limits*.

If one or both of the countries under consideration are on an inconvertible paper standard, the rate of exchange is determined in the same fashion, namely, by supply and demand. Since paper money cannot be converted into gold, however, there is no gold par of exchange and so there are no definite gold-shipment limits to fluctuations in the rate of exchange.

A third condition of foreign exchange fluctuation obtains when one or both of the countries involved attempt to stabilize the exchange rate at any particular point. If the English government wished to encourage her exporting business, for instance, she might set up a *stabilization fund* for such a purpose. The government's procedure would be to use the stabilization (or equalization) fund for the purchase or sale of sterling exchange at a fixed price in the domestic currency, *i.e.*, the government would buy pounds when the rate was too low and would sell them when the rate was too high.¹ This active control by governmental agencies can be used to stabilize the exchanges at any rate desired as long as the stabilization fund is solvent. There are, of course, limits to the height and depth of such stabilization procedure at which no international trade will take place in a given direction. Thus practical exchange control seeks to minimize undesirable fluctuations, since it must permit the long-time balance of exports and imports necessary to a continuation of foreign trade.

Relationship between Price Levels and Foreign Exchange Rates.—A common misunderstanding exists concerning the relation between price levels and the exchange rates. It is often said that the rate of exchange between two countries on paper standards normally will be at the ratio of the purchasing powers of the two monies and that the price levels of the two countries will correspond to this exchange ratio. This theory assumes that the prices of goods which enter into international trade fluctuate in accordance with the general price level, but this equivalence is not actually the case. The rate of exchange can express a ratio between the purchasing power of the respective monies only

¹ This procedure was followed by the United States government, the British government, and other large governments with some stabilizing effect in 1938.

for those goods which are exported and imported, and the prices of these goods need not fluctuate with the general price level. The general price level in fact has very little influence on this exchange ratio. It should be observed also that interest rates and the flow of capital, especially short-term capital, will prevent the rate of exchange from being an exact ratio of the purchasing power of the monies even in regard to goods entering into international trade.

There is, of course, some relationship between the prices of goods internationally traded and the prices of goods sold only domestically, but it need not be a direct relationship. Changes in the demand curves and costs curves for goods exported may cause fluctuations in their prices, may change the conditions of competition, may redirect a portion of the national income from other goods, and may cause a change in the general proportion of the factors of production utilized both at home and abroad.

Therefore, we must consider the principle of international trade in this connection to be as follows: there is no direct connection between exchange rates and general price levels. There is a direct connection between the rate of exchange and the prices of goods entering into international trade, but even in this latter situation interest rates, new products, and changes in costs and demand schedules may prevent the rate of exchange from expressing the exact purchasing power parity between the two monies.

Role of Banking in International Trade.—Banks perform an important series of functions in transactions between persons in different countries. In fact, since foreign trade is carried on by means of credit instruments, the bank is an institution that is essential to foreign trade. These references to banks do not include all the banks within a country, but refer to those large banks usually situated in the leading trade and financial centers of the respective nations. Some of the many functions performed by these banks may be listed as follows: (1) as dealers in foreign exchange, they act as middlemen to bring together the buyers and sellers of different foreign monies; (2) as bookkeeping establishments, they keep records of the supplies of these monies and the amount of transactions in them; (3) as dealers in short-term investments, they keep rates on a given money at equilibrium in the different foreign exchange markets; (4) as dealers in credit, they advance funds to domestic exporters by discounting time

bills before they are due, and thereby furnish an addition to the supply of monetary purchasing power; (5) as handlers of international accounts, they balance accounts between banks and thus direct much of the flow or earmarking¹ of gold; (6) as independent markets for short-term funds, they handle and often influence the flow of capital between countries.

Most of these functions are readily understood in view of what has been said above concerning international finance. When banks act as markets for short-term funds, however, the way in which their activities may affect exchange rates requires further discussion. If the short-term interest rate (bank rate) is higher in New York than it is in London, for instance, there will tend to be a flow of short-term money into New York. Such a change in the bank rate affects the foreign exchange market in two ways. First, this attractive rate increases the supply of foreign monies available for investment and strengthens the dollar on the exchanges. It also may cause the prices of long-term securities to decline and so eventually increase the number of purchases of American bonds by foreigners. This activity ultimately will strengthen the dollar on the exchange. Second, this high rate may deter American businessmen from using time bills in their foreign transactions and so may decrease the amount of monetary purchasing power available at the time. To the extent that this decrease in purchasing power affects the prices of exportable goods, there will be a decrease in their prices and perhaps eventually an increase in the amount exported.

Problems of Payment of a Large International Debt.—In a world characterized by increasing nationalism and the attendant self-sufficiency programs, the export and import of goods are increasingly difficult. The new exporting technique is the export of capital. Such investments often take the form of a flow of equipment across international boundaries. A large exporting business in the United States may find it difficult to ship goods into Canada, for instance, because of the tariff wall and therefore may invest capital in a plant on the other side of the Canadian border to produce inside the Canadian tariff wall. This shipment of capital is not a new development, for it was the importa-

¹ Earmarking is an economy procedure whereby gold is not shipped but is merely marked as belonging to a bank in another country. This saves cost of transportation.

tion of capital from Europe which was largely responsible for the growth of the United States. It has obtained increasing significance in this period of high tariffs, however, not only because it is a means of financing exports but also because the high tariffs make it increasingly difficult to repay such investments.

Since the World War, and partly as a result of that conflict, the United States has become a creditor nation. A creditor nation is one that has more accounts receivable from foreign individuals, corporations, and governments than its own individuals, corporations, and government owe to others. So far as the origin and problems involved in these debts are concerned, they are all quite similar. They differ chiefly in their form and in the parties involved. In order for businessmen in the United States to continue to make large sales to Europe after the war, they had to follow the same policy that the United States government followed in "selling" goods to European nations during the war—namely, to sell the goods on credit. Our foreign selling, like our installment selling, has been a method of getting goods into purchasers' hands when they are unable to pay for them in cash at once.

This extension of credit is a fairly simple problem. All the loaning government or businessman has to do is to ship out the goods and import the promises to pay. The purchasers get the goods they want and there is little difficulty until it is time to pay interest on the loan or to repay the principal. Keep in mind that there are only three forms of payment that are satisfactory to the creditor, namely, goods, services, or gold. The person or government which is about to make a payment or a loan must do two things: (1) obtain the goods, services, or gold; and (2) get them into the country that has extended the loan. In other words, the creditor country must import a value of goods equal to the amount of debt to be paid in order that the foreigner will have claims on enough purchasing power in the creditor country to make the payment. Since the United States does not wish to import large amounts of services by foreigners, and since foreigners do not, in general, have large amounts of gold, the only way for them to acquire that claim on American dollars is to sell foreign goods in the United States. The United States tariff prevents this practice to an effective degree. To illustrate this point let us turn our attention to the Allies' debts to the United

States as the result of loans made to finance the conduct of the World War.

Allied Debts.—The Allied governments owe the American government about 10 billion dollars. Most of this sum was expended in the United States by the Allies in the purchase of goods which were exported to Europe to aid in the conduct of the war. Without considering the interesting problem of whether or not the Allies *should* pay these debts, or even whether or not they *intend* to pay them, we turn to the problem of whether or not they *could* pay them. This problem involves two parts. The first is whether the government of France, for example, can tax the people of France to obtain a sufficient amount of francs which, if translated into dollars, would pay the debt owed. The second part of the problem is whether the French government can buy enough dollars with these francs to pay the debt. Remember the American government, as well as the American businessman, wants dollars and not foreign money when payment is made. Of course, these francs could be put on deposit in a French bank and then reinvested in France. In that case, the United States is importing another batch of securities, but the day of reckoning is merely postponed. In order for the French government to be able finally to repay the debt, it will be necessary for the French exporters to ship goods into the United States or for Americans to make large expenditures for French services.

It would have been less difficult for France to have paid a portion of her debt to the United States before the depression got under way. During the twenties American tourists were spending large sums in France, and these expenditures created many millions of dollars of balances which Frenchmen had available in United States banks. This export of goods and services would give the Frenchmen claims on dollars in the United States banks. Then the French government could purchase these claims with the francs it had acquired through taxation and turn the dollar claims over to the United States government in payment of the debt. However, the depression, with its customary effect on expenditures for luxuries, greatly curtailed the French export of goods and services and thus reduced the balances available for debt payments.

Effects of Debt Payments.—Although the difficulties involved in paying such large international debts are evident, we neverthe-

less may examine the effects if such a debt were paid. The paying country must obtain an excess of exports of goods over imports of goods. This procedure is aided somewhat by the fact that the taxation of the government in raising the funds may decrease the money in circulation and so may lower prices. This event would encourage foreigners to buy more goods in the debtor country. We have pointed out, however, that this effect would follow only if the prices of exportable goods fell and if a corresponding increase in credit from other sources did not occur in the debtor country. Conversely, of course, an increased purchasing power would be available in the receiving country from the release of the claims held by foreigners in the United States banks. An increase in the discount rate of the debtor country and a decrease in the discount rate of the creditor country may assist this price level change. The payment of the debt would increase our imports of goods and decrease our exports of goods, unless the higher discount rates encouraged an outflow of short-term credit to the debtor nation. During this period of payment the foreign exchange rates would rise as the demand for imports increased.

Effect of the Devaluation of the Dollar on Exchange Rates.—On January 31, 1934, the President of the United States, under the powers granted him in the Thomas Amendment, reduced the gold content of the dollar (see Chap. VII). There were two main features of this action which interest us at this point. First, its immediate effect on the exchange rates was to raise the foreign rate or to weaken the dollar on the exchanges. In so far as gold standard countries were concerned, the relative weights of the standard monies changed considerably. The theoretical par of exchange with Great Britain, for instance, rose to \$8.2397 from the former par of \$4.8665. The second feature of this reduction of the gold content of the dollar was its effect on the flow of trade between the United States and other countries. From the point of view of the American purchaser of goods abroad, this reduction of the dollar to 59 percent of its former gold content had the effect of an increase of 69 percent in the tariffs on imported goods, except on goods from countries which also had depreciated their money in terms of gold.

When we say that it had the effect of an additional tariff, we do not mean that the tariff rates actually were raised, but that it was increasingly difficult to obtain goods from abroad. In other

words, after the devaluation it took more dollars to buy claims on foreign money than it did before. Thus the same amount of American money purchased 41 percent less abroad than it did before this reduction in the gold content of the dollar. The condition was temporary, however, since the increase in American exports relative to imports acted as a force to bring the foreign exchange rate downward. This result, accompanied by rising prices in the United States and the reduction of tariff barriers through reciprocal trade agreements, tended to encourage imports again and so offset the immediate effects of the change in the gold content of the dollar.¹

There were other significant international repercussions to this policy so far as gold standard countries were concerned. An outstanding problem involved the monetary systems of the gold standard countries, since the increased price of gold in the United States tended to attract gold out of their banking systems into the United States and thus made it increasingly difficult for them to stay on the gold standard.

Note. See problems and references at end of Chap. XI.

¹ It should be observed at this point that there was some encouragement of imports even before the price changes and tariff reductions. These imports were largely raw materials for the purpose of building up inventories in anticipation of further devaluation of the dollar. The uncertainty regarding future governmental policy prompted this importation. Also it should be kept in mind that the rising prices referred to were not necessarily the result of the devaluation of the dollar, for it had little influence on the price level. The government spending program, through PWA, etc., was perhaps the main influence on the general price level.

CHAPTER XI

INTERNATIONAL TRADE AND FINANCE (Continued). . . . .	193

III. FOREIGN TRADE POLICY

The foregoing analysis of the somewhat intricate mechanism of international trade has not accounted for the ways in which it is curtailed and influenced by the machinery of government. Since the economic advantages of specialization and large-scale production are evident, the unsophisticated person might expect the peoples of the various countries to give every encouragement to foreign trade. With its increased scope of competition and its wider markets, foreign trade certainly would compel manufacturers to produce for sale those things for which they were best equipped. Under such conditions, it would be reasonable to expect the productivity of both men and machines to be greater in terms of use-values than when trade is restricted by artificial barriers. However, to expect people to allow for such freedom is to assume that they set up efficiency and maximum output as the goal they wish to reach. Such an assumption is far from fact. The motivating force which directs most businessmen's behavior is personal profit, and profit for themselves frequently is based on scarcity and not on efficiency. Therefore, even though individuals may accept as desirable the huge free trade market contained within the boundaries of the United States, they are unwilling to extend that free trade market beyond the national border.

We must treat the problem of human restrictions to foreign trade as a practical problem. The current policies in foreign trade are not based on a desire to obtain a higher standard of living for the majority within the United States. They are determined and defended by a minority for the higher standard of living of that minority, at the expense of a lower standard for the majority. A tariff on sugar, for example, becomes the law of the land as a result of the logrolling and lobbying of the sugar producers so that certain persons may obtain a higher price for

their sugar, yet such legislation is to the disadvantage of every consumer of sugar in the United States.

Mere indictment of trade barriers is but mental exercise for the indictors. We cannot make scientific plans for changes in foreign trade policy until we have learned all that we can about its operation and effects. It is necessary for us to make certain in our own minds, when we come to make such suggestions, just what goals we wish to set up for the industry of our nation. Do we want a policy which exploits the majority of consumers and nets large profits for a few bankers and businessmen, or do we want a more equitable distribution of a larger national income?

Trade Barriers.—The tariff is the most generally used and best known of the man-made obstacles to a free flow of trade between countries. A tariff is a tax on commodities entering one country from another country. As a condition of entry the government demands payment of the tax by the persons importing the goods. Not only is the tariff a tax, but it is a tax paid by the people in the country which imposes the tax. In other words, the levying of higher tariff duties by the United States government means higher taxes on the people of the United States.¹ It is well to keep this fact clearly in mind to avoid the possibility that one's patriotism may becloud the issue should one believe that, after all, the tariff burden falls on the foreigner.

The position taken by our courts on the tariff issue is that to discriminate against importers is "American." In fact, judges have stated on many occasions that Americans have a *right* to export goods—to ship wealth out of the country—but that they may import goods—bring wealth into the country—only because the government grants them such a *privilege*.

¹ The principles of tax shifting apply to the tariff as they do in any case of indirect taxation. The amount of the tax that is shifted will depend upon the elasticity of demand for the product as well as on the conditions of production both at home and abroad. It happens at times that the price for a commodity protected by an additional tariff duty may not rise in the domestic market by the full amount of the tax. Under such conditions, the foreign producer, who has expanded his industry to serve part of the American market, may have to pay part of the tariff in reduced profits since he cannot decrease production without greatly increasing his unit costs. (See Chap. XXV for a discussion of the shifting and final incidence of taxation.)

United States Tariff.—From its inception the United States has had tariffs against imported goods. At first, the use of this government-enforced restriction to trade was defended on the dual grounds of revenue and of protection to domestic industry. In more recent times only the latter argument has been of much significance.

In order that we may have some understanding of the nature of this tax law before we attempt to evaluate it, let us turn our attention to a few of its technical features. The tariff in force at present is the Smoot-Hawley Tariff, or Public Law No. 361.¹ This tariff, as a series of taxes on imports, is drawn up with four titles or parts:

Title I. Dutiable list.

1. Chemicals, oils, and paints (97 paragraphs).
2. Earths, earthenware, glassware (36 paragraphs).
3. Metals and manufactures of (98 paragraphs).
4. Wood and manufactures of (12 paragraphs).
5. Sugar, molasses, and manufactures of (6 paragraphs).
6. Tobacco and manufactures of (5 paragraphs).
7. Agricultural products and provisions (83 paragraphs).
8. Spirits, wines, other beverages (15 paragraphs).
9. Cotton manufactures (24 paragraphs).
10. Flax, hemp, jute, and manufactures of (23 paragraphs).
11. Wool and manufactures of (22 paragraphs).
12. Silk manufactures (11 paragraphs).
13. Manufactures of rayon, other synthetic textiles (13 paragraphs).
14. Papers and books (13 paragraphs).
15. Sundries (59 paragraphs).

Title II. Free list (114 paragraphs).

Title III. Special provisions.

Title IV. Administrative provisions.

In the dutiable list are found two types of customs duties, *i.e.*, the *specific* duty and the *ad valorem* duty. The specific duty is a fixed sum of money to be paid on some stated unit or quantity of a commodity, for example: "Paragraph 310. Sheets or plates of iron or steel, etc., 1 cent per pound." The *ad valorem* duty, on the other hand, is a fixed percentage of the value of the imported article, for example: "Paragraph 320. Electric storage batteries and parts thereof, etc., 40 percent *ad valorem*." In

¹ With some modifications examined under the treatment of reciprocal trade agreements, pp. 201 to 203.

some cases, imports are taxed with a combination of these two types of duties, for example: "Paragraph 358. Safety razors, etc., 10 cents each and 30 percent ad valorem."

Principles of Tariff Making.—This brief introduction to the form of the tariff indicates how complicated a matter it is, a complication which arises out of the mere difficulty of classification of the multitude of products which enter into trade and the determination of rates on each of these many items. The forces which make tariff writing even more complex and chaotic are those which influence the inclusion of these items and rates. Ask yourself how a tariff comes to be. How does it take the form it does? You will find that each separate item in the tariff is proposed and lobbied for by the producers of that particular product. In other words, small minority groups each contribute their little portion to the patchwork which becomes the tariff law. If you are producing steel rails, you want to eliminate as much competition from other producers of steel rails as possible. Therefore you may approach other American producers of rails and arrange some sort of price agreement with them; then, with your interested and newly found friends, you may approach the members of Congress to persuade them that elimination of your foreign competitors would be for the good of the United States. Of course, it would be difficult to persuade the people who buy steel rails that it is for their good that they pay higher prices for rails, yet such is the way in which the tariff comes into being.

Tariff making appears to be largely a matter of cajolery, bargaining, influence, and compromise by vested interests to obtain protection for their individual products. And so it is. However, some lip service is paid to the principle of equalization of costs at home and abroad when it comes to a matter of fixing the tariff rates. The idea here is to set the tariff rate so that it will raise the price of the foreign commodity up to the domestic cost of producing the product. Since no two producers, either at home or abroad, have the same costs of production, such an equation becomes rather meaningless from a scientific point of view, but a businessman's translation of this principle is to set the tariff so that it will equalize the costs of the most efficient producer abroad and the least efficient producer at home. This rate may be sufficiently high to encourage increased investment in a particular business in the domestic area. Thus the unit

costs of production may be increased by allowing more inefficient producers to enter the field, as well as allowing the more efficient to extend their production farther past the point of lowest unit cost. Then there is a new demand upon Congress to raise the tariff to equalize the costs again.

Tariffs for Revenue.—Tariffs are no longer especially significant as sources of revenue to the federal government. There are three main reasons for the decline of customs duties as revenue producers. First is the increase in other forms of taxation as sources of revenue. In the first 20 years of United States history, from 1790 to 1810, customs duties brought in 90 percent of the total revenue of the federal government. In the last 20 years, customs duties supplied but 9 percent of the federal income. Second is the increase in tariff rates themselves. As the rates are raised, trade tends to decline and so less customs duties may be collected.¹ Third is the increasing cost of collection of these customs duties with the result that the net yield of a tariff tends to decline.

Revenue is obtained from customs duties only when the tariff is not so high that it keeps goods out of the country. The more protective a tariff becomes, the less important it tends to be as a revenue measure. The desirability of tariffs for revenue purposes, therefore, is a problem to be analyzed under the subject of public finance for it is a problem of weighing the advantages and justice of indirect taxes as compared with direct taxes. The customs duty, as a tax, is an indirect or "hidden" one in the main.

Tariffs for Protection.—The purpose of tariffs as restrictions to the flow of trade is to protect the domestic producer from competition from the foreign producer. As a tax, the tariff is discriminatory, for it falls on some commodities in some places and not on others in other places. Since the international trade of the United States is only 5 to 10 percent of our total trade, some persons say it is not of sufficient importance to demand much consideration. The apparently minor role played by foreign trade is due in part to the existence of the tariffs which curtail this trade, but even 5 percent of our trade may mean the difference between profit and no profit for many producers.

¹ A perfectly protective tariff means a complete prohibition of imports of the commodities protected. In such a case, the tariff would bring in no revenue at all.

Any factor which affects the amount and nature of goods offered for sale, the conditions of producing these goods, and the amount and nature of the demand for these goods is a potent force in determining the price structure of an economy. If this factor also decreases or intensifies competition, it deserves special attention as a price-determining force. The protective tariff is such a factor. It must be recognized, however, that the customs rates alone are not responsible for the entire power of the tariff to affect the price structure. The administrative features of the customs provide an attendant and additional group of forces which lend weight to the role of the duties themselves. In fact, as will be illustrated later,¹ different methods employed in administering a tariff may greatly increase or decrease the amount of protection which the tariff schedule affords.

The protective tariff, in operation although not always in intent, acts to keep some goods within the nation as well as to keep others out. Trade barriers reduce exports as well as imports and so even may prevent exportable goods from ever coming into existence within the economy. That means, of course, that the existence of a tariff changes both the total quantity of goods and the quantity of particular goods which are sold within the economy. Tariffs affect the total supply of and demand for goods, and any change in the total quantity of use-values exchanged within the nation means a change in purchasing power and probably a change in the standard of living.

A given protective tariff causes a distribution of the factors of production different from that which would exist under some other tariff or under free trade. Thus the efficiency and the prices of the factors are affected. Costs of production not only are a source of high tariff arguments but also are different because of the tariffs themselves. This problem can be pushed on back to the effect on the distribution of income to the owners of these factors and through these persons to the demand on the market for all commodities. In pursuing this matter, one finds that the imposition of a tariff not only may change the cost of the marginal unit of the output of an industry but also may shift the entire cost curve either to the right or to the left. Also the elimination of foreign importation through higher tariffs may cause both the position

¹ See p. 199.

and the slope of the demand curves for certain goods to change. It may be noted, in addition, that this tax barrier may affect prices through its influence on the amount of profits made by protected industries. Some industries which are now making net profits would not be producing at all and others would be producing more were it not for protective tariffs.

Administrative Features of the Tariff.—A generally overlooked but nevertheless potent phase of protective technique acts along with the customs duties themselves. It is convenient to group these more disguised protective measures under the title of administrative protection. Here we find that the administration of customs formalities, rules regarding marks of origin, veterinary and sanitary regulation, food and drug regulations, laws concerning the assessment of ad valorem duties, and the process of classification of imports all contribute to the national policy of controlling the flow of goods in international trade. Instances can be cited where the charges for the formalities at the customs border have more than doubled the ad valorem equivalent of the statutory tariff rate. In many countries the slogan of "public health" has been used to justify actual prohibition or discrimination in regard to imports of foods and similar products. Frequently the enforcement of these regulations against imports is much more strict than similar regulations affecting domestic commodities. Another, but quite different, form of administrative protection arises out of the technical problem of classifying goods for entry into the country. The gamut of "commercial designation," "legislative intent," "chief use," or "in chief value thereof" must be run, and during such procedure imports may be held up indefinitely. In fact, the uncertainty involved in the awaited decision, as well as the cost of bond, and so forth, may inhibit importation more effectively than if an even higher but certain rate had been applied in the first place.

The Case of Protective Tariffs vs. Free Trade.—We now turn to a further evaluation of the case for and against the policy of governmental restrictions on foreign trade. The case for no tariffs or even for lower tariffs has already been presented. It is, in brief, that freer trade allows for more specialization in the activities for which the people and resources of a nation are best fitted. This specialization leads to greater efficiency which in

turn means lower unit costs and a greater output per man. A greater production within an economy permits a higher material standard of living.

The arguments for protective tariffs are many and varied. Some of them no longer have political significance and so may be disregarded. A few of them deserve some attention and evaluation. One is the argument which favors tariffs for the protection of infant industries, asserting that a new industry in a country, if it is to grow, must have some protection until it can expand its sales and scale of output and until it attains a position of efficiency arising out of large-scale production methods. This argument has some justification in so far as it applies to a new industrial country and in so far as the protection given is for an industry which ultimately will become as efficient as its foreign competitors. However, keeping in mind the fact that the tariff rate obtained for this infant's protection was acquired by lobbying and minority pressure by the owners of the industry, it is obvious that it would be difficult to remove that protection after the industry had become mature and thus had attained still greater political power.

Another argument used to support a tariff arises out of the desire for self-sufficiency. This one is largely a military argument. A tariff, if high enough, will force the people within a country to produce the basic necessities themselves and thus they will be prepared in case of war to supply the country with its needs.¹ Certainly such an argument can be maintained by those who place self-sufficiency above a higher standard of living. We learn from the German experience regarding the production of nitrates and other war essentials, indeed, that a policy of self-sufficiency encourages a nation to study new methods of production and to seek new uses for other commodities to make up for the deficiency in regard to certain raw materials. Scarcity thus may act in some cases as the mother of invention and ingenuity. Although this self-imposed scarcity may encourage such developments, however, it does so only at a tremendous cost to general welfare.

Frequently it is maintained that the United States must have high tariffs to protect its laborers. This argument is the one commonly used by protectionists. It asserts that the high wages

¹ See list p. 181.

in the United States are due to the existence of the tariffs and that a removal of these tariffs would force wage rates down to the level of wage rates in other countries. No more insidious and fallacious argument could be brought forward. First of all, ask yourself why the industrialists in the United States pay higher wages than are paid in other countries. Since American businessmen are not likely to be more generous than foreign businessmen, there must be some reason other than philanthropy for these higher payments. Is it because labor is more completely unionized than in other countries? Obviously not. American workmen receive higher wage rates because an individual laborer in the United States, working with better resources, machinery, and technical supervision, is more important to his employer than is a single foreign laborer to his employer. In other words, the marginal importance of a laborer often is greater in the United States than in other countries. In addition, it is an interesting fact that the average wages paid in non-protected industries are higher than in the tariff-protected industries.

The real weakness in the high-wage argument rests upon the relation of wages to prices. The only way in which wages affect the immediate prices of goods produced is in their role as costs of production. As costs of production per unit of goods, the wages do not enter as daily wages but in labor cost per unit of output. In this respect, the labor cost in each unit produced in our modern factories is on the average considerably less than it is in other sections of the world. As a consequence, Germany, for instance, raised its tariff recently because "We Germans can't compete against the high-wage production in the United States."

Reciprocal Trade Agreements.—Despite the logically vulnerable position of tariff arguments, we still have protective duties. However, an attempt is being made to decrease the prohibitive height of this customs wall through bilateral treaties. This effort by the present administration stands out clearly by contrast with the general trend toward national self-sufficiency in the world today. The Reciprocal Trade Agreements Act was signed by the President on June 12, 1934, and almost immediately thereafter negotiations were initiated with a number of other countries. This act authorized the President to negotiate trade treaties which may alter the duties in the 1930 tariff act by no more than 50 percent. The avowed purpose of the act is that "of expanding

foreign markets for the products of the United States. . . . Whenever he finds as a fact that any existing duties or import restrictions of the United States or any foreign country are unduly burdening and restricting the foreign trade of the United States . . . [the President] is authorized from time to time to enter into foreign trade agreements with foreign countries or instrumentalities thereof. . . ."¹

Since the United States was already a party to twenty-nine trade treaties which contained the provision that the United States must extend the favors granted in these treaties to other nations—*i.e.*, unconditional most-favored-nation clause—it seemed advisable to conclude these new trade agreements on the same basis. Thus the trade agreements extend the conces-

TABLE 12.—TRADE AGREEMENTS CONCLUDED BY NOVEMBER 2, 1936

Country	Effective date
Belgium.....	May 1, 1935
Brazil.....	January 1, 1936
Canada.....	January 1, 1936
Colombia.....	May 20, 1936
Costa Rica.....	Not yet effective
Cuba.....	September 3, 1934
El Salvador.....	Not yet effective
Finland.....	November 2, 1936
France, and its colonies, dependencies, and protectorates other than Morocco.....	June 15, 1936
Guatemala.....	June 15, 1936
Haiti.....	June 3, 1935
Honduras.....	March 2, 1936
Netherlands, including Dutch East Indies, Dutch New Guinea and Dutch West Indies.....	February 1, 1936
Nicaragua.....	October 1, 1936
Sweden.....	August 5, 1935
Switzerland.....	February 15, 1936

sions granted to any one country to all other nations except those which specifically discriminate against the United States in their trade policies. At first glance it would seem that the United States was granting more favors than it received. The concessions which have been made, however, have applied almost solely to those products in which the interested parties are the

¹ An Act to Amend the Tariff Act of 1930, Public Law No. 316, 73d Congress (H. R. 8687), June 12, 1934.

chief sources of supply. The specific effect is to lower tariff rates on particular products, while the general effect is to encourage the use of the unconditional most-favored-nation clause and to discourage discrimination throughout the world.

Since many factors affect the flow of trade, it is difficult to judge the effects of these reciprocal trade agreements, but some possible results of the program may be indicated. In view of the creditor position of the United States, this lowering of import barriers has encouraged the entrance of imports into this country. The fact that the greatest increases in imports have appeared in those goods which were affected by the trade agreements would seem to be *prima facie* evidence that the trade agreements have been accomplishing their purpose. Not only have these reductions in tariffs increased the flow of trade in particular items but also they have aided in the flow of goods not inhibited by tariffs, for additional purchasing power has been made available to foreigners for the purpose of buying other goods.

Numerous complaints by large industries that these tariff reductions have greatly increased their competition and have hurt their business are in the main misleading. The American Iron and Steel Institute complained, for instance, that imports of iron and steel products on which duties were lowered by the Belgian agreement had increased by about 175 percent; yet this industry exported almost twenty times as much as was imported in these products during the same year. Certainly such an industry stands to gain more than it would lose from decreased tariff barriers throughout the world.

Trade Policy for the Future.—The reciprocal trade agreements are encouraging for those who approach the problem of international trade policy from the point of view of advantages to society as a whole rather than from the point of view of certain special interests. Still, they do little more than scratch the surface and perhaps slow down the trend toward still higher tariff walls. In a society organized for conflict rather than cooperation, these bilateral agreements are but a step in the direction of social benefit.

What should the future policy be? What are the alternatives? We have as one choice the policy of increasing our isolation from the rest of the world by means of higher tariffs, quotas, and outright prohibitions. This program, of course, would mean a

decrease in efficiency and an increase in permanent government production controls in our export industries, similar to those we now have in agricultural products.

TABLE 13.—EFFECTS OF RECIPROCAL TRADE AGREEMENTS, JANUARY–JUNE 1936*
Total Exports; Imports for Consumption
(In Thousands of Dollars)

	U. S. Exports		U. S. Imports		% Increase	
	1935	1936	1935	1936	Ex-ports	Im-ports
Total	\$1,024,111	\$1,154,141	\$984,351	\$1,152,017	12.7	17.0
Total 6 agreement countries†	254,076	288,583	268,339	341,623	13.6	27.3
All other countries.	770,035	865,558	716,119	810,394	12.4	13.2
U.S.S.R.	9,538	20,822	7,895	11,095	118.3	40.5
All other countries excluding U.S.S.R.	760,497	844,736	708,224	799,299	11.1	12.9
Cuba§ (6 mos.)	28,138	33,138	56,908	85,057	17.8	49.5
Belgium|| (4 mos.)	17,090	18,754	10,969	17,019	9.7	55.2
Haiti¶ (5 mos.)	1,240	1,528	412	717	23.2	74.0
Sweden (6 mos.)	17,283	19,349	16,383	20,677	12.0	26.2
Canada (6 mos.)	158,438	182,773	129,864	159,767	15.4	23.0
Brazil (6 mos.)	21,866	24,209	47,395	49,306	10.7	4.0
Honduras** (4 mos.)	1,772	1,743	2,627	2,281	1.6†	13.2†
Netherlands†† (5 mos.)	20,200	21,415	15,261	17,941	6.0	11.0
Netherlands India†† (5 mos.)	4,532	5,132	20,952	25,505	13.2	21.7
Switzerland‡‡ (4 mos.)	2,656	2,482	4,620	6,488	6.6†	40.4

* Statistics from U. S. Department of Commerce, *Monthly Summary of Foreign Commerce of the United States*.

† Signifies decrease.

‡ With which agreements were effective on or before January 1, 1936: Cuba, Belgium Haiti, Sweden, Canada and Brazil

§ For first 6 months of 1935, compared with 1934, U. S. exports increased 30.1 per cent; imports rose 29.3 per cent.

|| Agreement effective May 1, 1935; figures are January through April.

¶ Agreement effective June 3, 1935; figures are January through May.

** Agreement effective March 2, 1936; figures are March through June.

†† Agreement effective February 1, 1936; figures are February through June.

‡‡ Agreement effective February 15, 1936; figures are March through June.

On the other hand we can maintain a protective policy but shift the burden of it from the purchaser of imported goods to the general taxpayer on the theory that protection benefits the nation as a whole. This procedure requires the removal of tariffs and the granting of government subsidies to those companies that are unable to compete with foreign producers. The bounty

method is preferable to the tariff in several respects. In the first place, only the companies which could not compete would get the government payment. Thus the unearned incomes which the more efficient plants obtain under the blanket tariff protection would disappear. In the second place, the cost of the protection would not hit the consumer indiscriminately through higher prices as it does with the tariff. This subsidy method would be more unpopular than the tariff, of course, since it would be so obvious that the protection afforded the favored industry or company represented a cost to the public. The tariff cost, which is hidden in the final consumer's price, is not so easily noticed or understood.

As a third alternative we could lower the tariffs gradually according to some definite plan and in accordance with certain definite principles. Such a plan might be outlined as follows. A commission, composed largely of engineers, accountants, and economists, would be created to study the problem and would be empowered to act upon the results of its study. The purpose of the study would be an analysis of the costs of all industries concerned with international trade in an attempt to determine the actual and potential efficiency of these separate industries, and the rate at which the instrumental capital in each of these industries tends to turn into finance capital. This last point means simply that the rate at which funds are set aside for depreciation, obsolescence, and replacement should be discovered for each industry. The commission then would classify industries in two groups: those judged efficient and those judged inefficient. Potential supplies of resources in the United States, as well as efficiency relative to foreign producers, should be considered.

As a result of industry classification, each industry would be notified that the tariff on its particular product would be removed completely at the end of a certain number of years. The number of years would vary with different industries and would depend on the rate of turnover of the finance capital in that particular industry. We should find that industry *A* might be considered actually or potentially efficient. Its tariff would be removed either at once or gradually. Industry *B* would be judged inefficient and its tariff would be removed in 10 years, say. During that period the funds accumulated for depreciation, replacement, and obsolescence could be invested in industries such as *A*

rather than back in industry *B*. Industry *C* might take 15 years, and industry *D* only 5 years.

Thus we would protect the present investors in those industries which ultimately are doomed until they could recover their funds through the normal course of business. At the same time, the efficient industries would receive additional capital investment for expansion, since their markets would be growing. This is at best a brief outline of the principles of a tariff program, and its success would depend in large part on the competency of the commission of experts who would carry it out. It has at least the advantage of being ultimately for the common good without the disadvantage of the tremendous costs which arise from *sudden* transitions in policy.

Problems

70. "If we buy steel rails abroad, we get the steel rails and the foreigner gets the money. If we buy the rails in the United States we have both the steel rails and the money." Evaluate.

71. "The engineering profession in the United States tends to gain from the removal of restrictions to the free flow of foreign trade." Explain.

72. "The devaluation of the dollar to 59 percent of its former gold content acted as a 69 percent increase in barriers to imports into the United States." Explain.

73. "The high wages paid to labor in the United States are due in large part to the high standard of living in the United States. The American tariff has been an important force in keeping this standard of living high as well as in keeping wages high." Evaluate.

74. "If our exporting industries can become sufficiently efficient, they can continue to increase their exports abroad without being concerned with the height of our tariff barriers." Evaluate.

75. Explain the relationship between the height of our trade barriers and the problem of conservation of our natural resources.

76. "Bringing into the United States goods made by low-paid foreign labor has made the depression in the United States worse." Evaluate.

77. "Since the money which a Frenchman has to spend is in the form of francs, an American merchant must be content to receive payment in francs if he expects to sell any goods in France." Evaluate.

78. "A 'favorable balance of trade' is necessary if a country is to increase in wealth and power, no matter whether the country is a creditor or debtor nation." Evaluate.

79. "The Reciprocal Trade Agreements include the unconditional most-favored-nation clause as one principle. This means that other countries can get the advantages of lower tariffs against their goods in the United States without making any concessions to American made goods." Evaluate.

80. "The welfare of the American people must be protected by higher tariffs—we could balance the national budget if these penurious foreigners would only pay us the debts they owe."—A Congressman. Do you agree?

References

BEVERIDGE, W. H.: "Tariffs, The Case Examined," Longmans, Green & Company, London, 1932.

COHN, D. L.: "Picking America's Pockets," Harper & Brothers, 1937.

Chamber of Commerce of the United States, Foreign Commerce Department: "Our World Trade in 1937," 1938.

Foreign Policy Association Headline Books: "Made in U.S.A.," 1935.

Foreign Policy Reports, "The Hull Trade Program," Vol. XII, No. 15, October, 1936.

GRAHAM, F. D.: "Protective Tariffs," Harper & Brothers, 1934.

VON HABERLER, G.: "The Theory of International Trade," The Macmillan Company, 1936.

KILLOUGH, H. B.: "International Trade," McGraw-Hill Book Company, Inc., 1938.

LEVETT, B. A.: "Through the Customs Maze," Customs Maze Publishing Co., 1923.

Public Law No. 361, "Tariff Act of 1930."

United States Senate: "World Trade Barriers in Relation to American Agriculture," Doc. No. 70, 1933.

United States Tariff Commission: "Regulation of Tariffs in Foreign Countries by Administrative Action, July, 1934."

United States Tariff Commission: "Trade Agreement with Canada, 1936."

PART III
VALUE THEORY

CHAPTER XII

CONSUMPTION

The purpose of all economic activity is the satisfaction of wants. Men do not labor indefinitely for the mere pleasure of working. They are thus active largely because they wish to enjoy the fruits of their labor. It is for this reason that a discussion of *consumption* precedes the treatment of *production*. Thus we may have more clearly in mind the goal of economic activity and so may more readily analyze the ways in which goods are produced, exchanged, and valued.

Meaning of Consumption.—The study of consumption is concerned with the utilities anticipated in connection with the utilization of goods and services. Utility was described in Chap. II as the capacity of an article or service to satisfy man's wants or desires. Thus consumption is an effort to experience the utilities which the consumer anticipated when he secured the commodity or service.

A discussion of the experiences of satisfaction obtained in consumption can be undertaken only in terms of the psychological laws of use-value. Here is the meeting place of economics and psychology. From this viewpoint we consider, not the cost of production of an article or its sales price, but merely its ability to satisfy a want. If an article is useful, it has use-value for it will satisfy someone's desire. Many engineers think of *value* in terms of this concept of *use-value* alone. Thus they are inclined to say that the number of units that society ought to produce is the number that will satisfy *all* desires for the article. Such a position ignores cost of production and the necessity to produce only that number which can be sold without loss. For this reason, in our economy, attention usually is given to *exchange-value*, rather than to use-value. The exchange-value concept, it soon will become apparent, is a very different one, for it is the resultant of the opposing forces of use-value and of cost of production.

The Psychology of the Consumer.—Man is essentially an organism which reacts to an environment. If the experiencing of a particular bit of the environment produces painful sensations, the organism reacts by avoidance; while the opposite stimulus of pleasant sensations will lead to an opposite response. Most important of all, the organism *learns* through experience to reject the painful and to accept the pleasant aspects of its environment. Learning is dependent upon the acquisition of habits or “conditioned reflexes.”

Reflexes are perhaps best explained by an analogy in the realm of chemistry. When two parts of hydrogen and one part of oxygen unite, under certain conditions, they invariably form water. They could not form anything else, nor could they keep from uniting as they do. In a similar way reflexes take place in the human organism, as when the finger is “unconsciously” jerked away from a hot object. What does happen, by the very nature of the organism and of the stimulus, *must* happen, and nothing else could happen under the circumstances.

Conditioned reflexes (habits) may be groups or chains of reflexes that have been acquired or modified by the process of learning. Hence, everything in the experience, the environment, of a man modifies his original nature, the most frequently met experiences having the greatest modifying effect. At birth the individual nervous system has within it the nerve centers upon which all habit, memory, imagination, and reasoning depend. Thus the various potentialities for development are remarkably numerous. Men’s actions come to be quite similar under a given set of circumstances, particularly if they happen to live in much the same environment.

The consumer, then, inherits an organism which, because of its growth and adjustment to environment, develops certain needs, wants, and desires. Because people live in groups, and because they are influenced by the lives of their neighbors and by the history of the race handed down by their ancestors, their needs and desires, as well as their habits generally, follow those of others about them.

Types of Action.—The attempt to satisfy desires results in three types of action. Some actions are *impulsive*. They represent behavior without forethought, and are reflexive or emotional in nature. The great majority of actions, however, are *habitual*.

These actions are the result of the modification of a group of reflexes. Thus the habitual smoker may light a cigarette without being at all conscious of what he is doing. Most activity is of this type. The greater portion of our purchasing is purely habitual; we ask for our usual brand of razor blades or of tooth paste without "thinking" much about the matter.

The third type of action is *rational* or *volitional*. It is the result of the logical balancing and careful weighing of evidence. Rational action, as a matter of fact, plays a minor role in the majority of human activities. Impulse and habit are far more important, even in the field of business relations. It is quite desirable, however, that many of our actions be habitual, for thus an immense amount of time and energy is saved for those occasions which actually require logical thought.

Diminishing Utility.—Consumers constantly receive pleasant or unpleasant sensations from a multitude of objects. Why do consumers not succumb to the first of these pleasant sensations they meet? Why do they not spend all their money on pie, or clothing, or airplane rides? The fact that they do not as a rule act in this way indicates the presence of an important principle of behavior, namely, *the satiability of a particular desire at a given time*. In psychological terms, we are speaking of the "fatigue law," that a constantly repeated stimulus results in a progressively decreasing response.

Consider the utility rendered by clothing. The utility of the first suit purchased is very high, for if it were not in a man's wardrobe, he would suffer not only from the inclemency of the weather but also to an even greater extent from a violation of the social custom which requires him to be adequately clothed before appearing in public. This high degree of utility is represented by the rectangle *A* in Fig. 10. An additional suit *B* would be desirable in many ways, but its possession is not such a vital matter as was that of *A*. Hence the utility of the second suit is less than the utility of the first, if a man possesses both at the same time. Of course, if the second suit were obtained only when the first was completely reduced to rags, the utility of *B* might be as great as the utility of *A*. Therefore we must consider only the case of simultaneous consumption.

The same analysis holds good for additional units such as *C* and *D*. Thus, as additional units of an article are consumed simul-

taneously, *the utility of successive units diminishes*. This reduction of desire for additional units is true of all commodities, the point of satiation and the commencement of disutility *E* (unpleasantness or pain) coming sooner with one and later with another. Hence the principle, called the *law of diminishing marginal utility*, is universal in application.

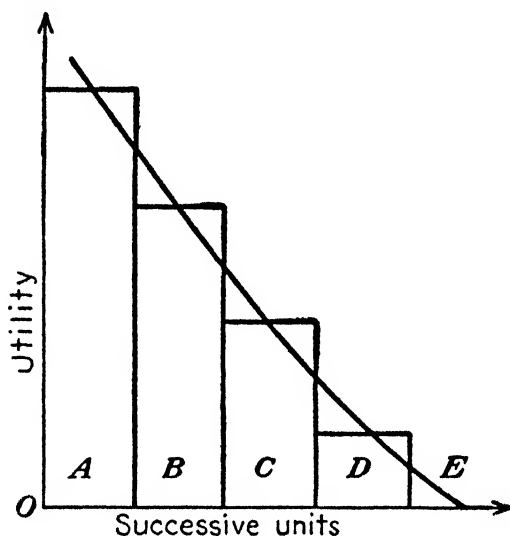


FIG. 10.—Diminishing marginal utility.

The Rate of Diminishing Utility.—The rate at which the utility of successive units diminishes varies widely among different commodities. At one extreme are the articles of which the first unit is desirable and a second is useless. Thus an electric range may have a high degree of utility for a housewife, but diminishing utility takes effect so rapidly that a second electric range, in addition to being useless, might really be an encumbrance and thus possess disutility. The same situation is true of electric refrigerators and washing machines.

At the other extreme are commodities whose desirability is but little subject to this law. For some the first few additional units may have *increasing* utility, though diminishing utility sets in eventually. This is frequently the case where the units taken are quite small, as would be true of successive bites of food or sips of water. Some authorities assert that the law of diminishing utility does not apply to money, meaning that the possession of \$1,000 is ten times as desirable as the possession of \$100. It is probably true, however, that there is no commodity or service to which the law of diminishing utility does not apply sooner or

later though, as we have said, the rate of diminution may vary between widely separated extremes.

Total Utility.—The *total utility* possessed by the various units of a commodity will continue to increase as long as the marginal utility of one more unit has a positive value. Thus the curve of total utility usually will be asymptotic and will reach a maximum point when the last unit added to the stock available has zero marginal utility. The addition of more units would decrease the total utility since these last units would have negative marginal utility or *disutility*. The student must be careful to distinguish between marginal and total utility if his analysis of this subject is to be valid.

The Utility of Complementary Goods.—It frequently happens that two or more commodities, each possessing utility, may enter into such a relation with each other when consumed together as to yield a total utility greater than the sum of their separate utilities. The utility of a room for living purposes may be increased considerably oftentimes by rearranging the various objects in the room. If commodities are consumed in a haphazard way, without regard to their relations to each other, a large part of their possible utility is lost. "Cultured" economic consumption is to be distinguished from primitive consumption largely by the absence of this haphazard element.

In dealing with complementary goods, and this category includes a large proportion of the articles consumed today, we should note that men are prone to assign much of the total utility of the group to the item whose addition serves to complete it. Thus a car without tires, or a car without gasoline, is of little value until the missing item is obtained. The utility of the missing item, therefore, frequently is rated a good deal higher than otherwise would be the case.

The Balancing of Utilities.—The order in which various commodities and services are desired tends to be determined by the relation between the anticipated yield of utility and the estimated cost or effort of attaining it. Indeed, the article having the greatest utility may not be the first one chosen, for it may have a high cost of attainment. Thus its desirability is overshadowed by that of another commodity having less utility but obtainable at a very much lower cost. The order of consumption is therefore determined by the degree of *net satisfaction* anticipated from

various articles, and it is a conscious or unconscious balancing of net utilities which determines the course of action of the consumer. This point is of sufficient importance to merit a more detailed examination. Assume there are four commodities with various degrees of net satisfaction, as shown in Table 14.

TABLE 14.—ASSUMED NET SATISFACTIONS FROM FOUR ARTICLES

Units available	Net satisfaction			
	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>
1	10	8	6	4
2	6	7	4	3
3	3	5	1	2
4	1	2	0	1

As additional units become available the net satisfactions decline but at different rates. If the consumer is able to buy only one commodity he will purchase a unit of *A*; if he is able to buy two, he will take one unit of *A* and one of *B*; if he can take five, he will use two of *A*, two of *B*, and one of *C*. Any other order of purchase will yield a smaller sum of net satisfactions and would therefore entail a loss from the consumer's viewpoint.

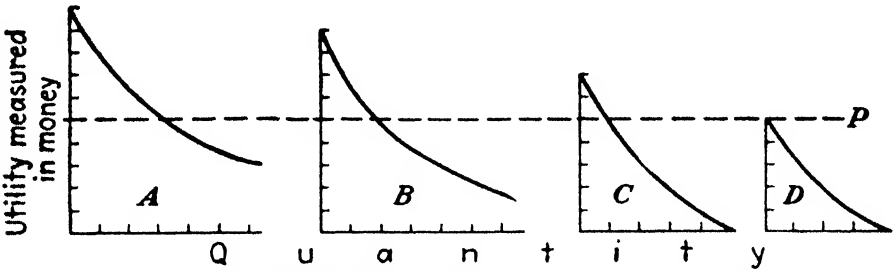


FIG. 11.—Diminishing utility related to sales price.

It may be well to anticipate at this point a part of the discussion of prices in Chaps. XIV to XVIII, where demand for an article is said to increase as price declines. The data of Table 14 may be plotted as curves of diminishing marginal utility as in Fig. 11. If the sales price is at the level of the dotted line *P*, different quantities of the commodities will be taken by the individual to whom these curves refer so that the marginal utilities of the final units of each article will be equal. If the sales price is raised the number of units taken by this individual will be

reduced and if the price is lowered he will take more units, although the rate at which he takes additional units need not be the same for different commodities since marginal utilities may diminish at different rates.

To the extent that consumption is rational, then, the order in which various commodities are purchased depends upon the balancing of utilities. Estimates of net utility evidently will vary between different persons, and so the resulting order of consumption will also vary among individuals. Finally, we may note that the order of consumption is undergoing constant revision as a result of alterations in net utility estimation due to price variations, style changes, and other factors.

Personal Budgets.—More efficient balancing of utilities by the consumer may be secured through the use of some form of personal budget. For example, a financial program for a family of four persons with an income of \$150 per month might be set up as shown in Table 15.

TABLE 15.—FINANCIAL PROGRAM OF FOUR PERSONS WITH \$150 MONTHLY INCOME

Monthly expenditure	Quantity	Percent
Food.....	\$ 45.00	30
Shelter (rent; or, if home is owned, taxes, interest on mortgage, repairs, upkeep).....	37.50	25
Clothing.....	19.50	13
Operating expenses (heat, light, laundry, telephone, household supplies, replacement of equipment).....	10.50	7
Life insurance..	10.50	7
Development (medical attention, education, church, charity, gifts, recreation, vacations, entertaining, books, music).....	15.00	10
Investment.....	12.00	8
Total.....	\$150.00	100

If the family income were increased, its apportionment would be altered. That is, the amount spent for food probably would not change materially so long as the original income permitted a reasonable living standard; thus the *percentage* of total income expended for this item would be reduced. The proportion spent for shelter probably would not be substantially altered. Therefore most of the increase in income would be left for expenditure

on the remaining items. The financial program of a family of two would show certain reductions in the proportion of total income spent for food, clothing, and operating expenses, expenditures for the other items being proportionally increased.

Consumption Guides Production.—Consumers enjoy a certain degree of freedom of choice respecting the articles they wish to buy. Every dollar that each consumer spends, or stands ready and willing to spend, is a “dollar vote” for the article he desires. These dollar votes of consumers direct productive activity first to one type of article and then to another, according to the varying expectations held by businessmen of the profits to be derived. Thus consumption guides production. The wishes of consumers expressed through dollar votes indicate the quantity and quality of goods that are to be produced.

Limitations on Consumer's Freedom of Choice.—This freedom of choice on the part of consumers is subjected to a number of limitations. Three important ones may be noted. First, the size of the income received by the consumer determines in part the ways in which he may spend that income. The freedom of choice of a man receiving \$1,000 a year is restricted very much more closely than that of a man enjoying an annual income of \$100,000. Second, at any given moment consumers' choices are restricted to the goods already on the market. The goods offered for sale are determined (a) by the technique of production at a given time and (b) by the dollar votes previously cast by consumers. Third, the fact that our economic system is actuated by the profit motive vitally affects the extent of consumers' freedom of choice. Not only will the profitable lines of goods be produced and the unprofitable ones be discontinued, but consumption can be guided to no small degree by means of advertising and salesmanship. The precise effect on consumers of such control by producers operating under the profit motive is a matter of controversy, but we shall point out some of the developments in this connection. The discussion will be given in terms of the degree of knowledge and ability the consumer exercises as a buyer of merchandise.

Consumer's Knowledge.—The buying problem most difficult of solution even for the thoughtful or rational consumer is that of winnowing the grain from the chaff of modern salesmanship. Such a consumer is constantly faced with the question: What

does advertising tell me about quality, and does this information differ from quality as determined by the impartial scientist? The answer must be a general denial of any close relation between advertised quality and quality as determined by impartial test.

Of thirty typewriter ribbons tested by a consumers' organization, the best was said to be one-seventy-fifth as costly as was the poorest ribbon, on the basis of the amount of satisfactory typing service rendered for one cent of the purchase price. Similarly, a test of hot-water bottles indicated that the daily cost of one article was related to the daily cost of another in the ratio of about 17 to 1; yet the "good" bottle, like the ribbon, was purchased in a 10-cent store.¹ The consumer frequently has no gauge of quality except prices. He believes that a high-priced article must be a good article, although tests often indicate the fallacy of this belief.

"Electrical flatirons imported at a landed cost of 77 cents sold at retail for \$5.50 and \$6.50, according to a Senate investigation. Marcel irons landed for 13 cents sold for \$1.89—a margin of 1,000 percent; Haarlem oil with a landed cost of 9 cents sold for 55 cents; cod liver oil landed for 7 cents sold for \$1.25; electric hair dryers were stepped up from \$3.57 to \$17.50; magnifying glasses from \$1.24 to \$12.00; table knives from 4 cents to 30 cents; cuckoo clocks from \$1.27 to \$22.00—in New York, the port of entry." (*Senate Document*, July 31, 1922.)²

"Here are some gentlemen who purchased second-grade galvanized roofing plainly stamped by the maker 'second.' Many jobbers and fabricators have no hesitation whatever in taking that stamp off with acid, and it is reported that one fabricator has gone so far as to stamp under the word 'second' the additional words 'to none!' He then sold it to the public as a prime sheet. . . . Farmers will be interested to know that some makes of fence wire are so thinly galvanized that the manufacturer has difficulty in getting it away from the factory before rust sets in." (C. L. Patterson, American Zinc Institute.)³

Dangerous Misinformation.—A much more pernicious form of the consumer's problem involves the misinformation he is all too likely to gather from advertisements. Just how often his

¹ Consumers' Research, Inc., Washington, N. J., *General Bulletins*, of October, 1935, and of October, 1934.

² From CHASE, STUART, and F. J. SCHLINK, "Your Money's Worth," 1928, p. 92. By permission of The Macmillan Company, publishers.

³ *Ibid.*, p. 105.

very life is endangered it is impossible to say, but the seriousness of the problem may be emphasized by a few examples.

The palm must be awarded to the preparation Kleanall (a drainpipe cleaner), containing 75 per cent of the violently corrosive poison, sodium hydroxide. Far from bearing the poison label, the printed matter read: "Does not injure the finest fabric or the most delicate skin."¹

Several widely advertised tooth pastes invite the assumption of a real hazard on the part of their users. For one, at least, the principal ingredient is a poison, namely, potassium chlorate. A tube of this tooth paste contains sufficient poison to kill four adults. Is the hapless consumer warned? Not at all, but think of what might happen if his child should like the taste of the tube's contents.

Antiseptics, to mention one more example, are not always what they seem. A large proportion of the more widely advertised "antiseptics" are not antiseptic at all. In spite of radio programs and advertisements in popular magazines, living organisms have been found in the antiseptic itself; they had lived there unharmed from the time the bottles were filled until they were sold. Plain alcohol mixed with an equal quantity of water proves in tests to be more efficient as a germicide than most popular brands of antiseptics, though the alcohol mixture itself is a poor germ killer.

Legal Status of Truth in Advertising.—The consumer receives little protection legally from fraudulent advertising claims. Speaking generally, a manufacturer may advertise in any way he wishes provided only that he does not thereby libel his competitors. If the manufacturer stays within the vague limits of "fair competition," his statements regarding his own product may be as exaggerated or as untrue as he may desire. Thus a wealthy resident of a city in western Pennsylvania died recently as the direct result of a radium-water "cure" taken on the basis of advertisements. Since the water actually contained radium, although in very dangerous quantities, no action could be taken against the seller. He is still free to kill gullible consumers who rely upon his published statements.

Some little protection is afforded the consumer, it is true, by the *Pure Food and Drugs Act*. The act forbids interstate shipment of misbranded or adulterated goods, but if the article bears a

¹ *Ibid.*, pp. 117-118.

special trade name it escapes control. Thus if the good is called "X brand" instead of butter, it actually may be unfit for use but the authorities cannot proceed against it on the ground that it is impure butter. Furthermore, there are few accepted standards of purity so that it is difficult to grade and test most articles. At present it is unlikely that action can be taken against a manufacturer unless it can be proved that he *knowingly* intended to defraud. Proof of intent is almost impossible to obtain. Thus the administration takes action against the *goods* instead of against the producer. He may lose a small shipment now and then but he suffers no real penalty which would tend to discourage these practices. Consumers are badly in need of a new food and drugs act which will afford them some real protection. Thus far attempts to pass such legislation have been defeated by manufacturers.

Solutions to the Problem. Government Purchases.—In pre-depression years the United States government purchased some 300 million dollars worth of supplies and equipment—ranging all the way from thumbtacks to dredging machines; from baseballs to battleships. Nearly every kind of thing the general consumer buys, the government bought—though not in such great variety—foodstuffs, textiles, clothing, furniture, building materials, office supplies, sporting goods, and toilet articles. But the several purchasing agents in buying much of this material paid little attention to the pretty girls in advertisements or to the visits of supersalesmen. They purchased on the basis of technical advice from the Bureau of Standards. During one fiscal year the bureau made no less than 180,000 tests. For an operating cost of 2 million dollars it is estimated that the Bureau of Standards saved the federal government in the neighborhood of 100 million dollars every year. There are also state and private testing laboratories engaged in this work, but few of the findings of any of these bureaus are at present available for the individual consumer. The publication and general dissemination of the technical knowledge already in the files of these organizations are advocated as one step in furnishing the ultimate consumer with adequate information concerning consumption goods.

Bureau of Standards' Specification Plan.—The Bureau of Standards is engaged upon a somewhat different solution of the problem. In 1921 the Federal Specifications Board was established for the

purpose of coordination and economy in the procurement of materials and services used by the government under specifications prepared in the various branches thereof, to avoid duplication of effort, and for the better utilization of resources and industries. To this board was assigned the duty of compiling and adopting standard specifications for materials and services and of bringing the specifications into harmony with the best commercial practice whenever conditions permit, bearing in mind the desirability of broadening the field of supply. These master specifications, to the number of 27,000, cover more than 6,650 commodities and have been made available for the use of the general public.¹ The Bureau of Standards believes that considerable economy can be realized in the purchase of commodities by the use of specifications. To apply the specifications plan to purchases of the individual consumer, however, one further step was necessary. The Bureau of Standards has prepared a list of over 2,000 manufacturers who have agreed to produce commodities to meet these specifications and to state this fact upon the container's label. Thus the over-the-counter buyer will be able to select products made to specification without requiring him to have technical knowledge of the specifications themselves.

Research for Consumers.—Since Bureau of Standards' data are not available for use by individual consumers, several organizations have undertaken the task of supplying consumers with the results of research activity. The pioneer in this field is *Consumers' Research, Inc.*, a non-profit organization whose members receive an annual "Handbook of Buying" and a series of monthly releases on more recent information. The handbook lists hundreds of commodities by *brand name* as "Recommended" or "Not Recommended." The listings are the result partly of tests conducted by the organization, partly of tests made by other reputable laboratories, and partly of the opinions of independent technical authorities in the various fields concerned. Any consumer may receive the information upon payment of the annual membership fee. Recently a similar organization, *The Consumers' Union*, has appeared as a result of a split in the original body. It offers the same type of service.

¹ Alphabetical Index and Numerical List of United States Government Master Specifications Promulgated by the Federal Specifications Board, Bureau of Standards, *Circular 319*, Government Printing Office.

The commodity listings make very interesting reading for any one in sympathy with the consumer's search for his "money's worth," but this solution for the consumer's problem has some weaknesses. For one thing, few consumers will refer to a bulky catalogue to find which brand of a 25-cent article is best. If the purchase involves a large expenditure, on the other hand, most of us would be glad to obtain whatever technical information is available. Thus the commodity list's usefulness may be restricted to the more significant but less frequent purchases, while the Bureau of Standards' plan may be most useful for the low-cost articles bought every day.

Another weakness of the consumer's organization is lack of funds, which is due to the need for a low membership fee. Thus it is impossible for the organization itself to test many commodities, unless it has a very large membership, and so its usefulness may be restricted. Furthermore, there is always the danger that such a body may fail to maintain the scientifically dispassionate viewpoint that is essential to its success. Nevertheless, these attempts at fact finding on the part of some groups of consumers may ultimately benefit everyone. Producers and sellers may come to recognize a consumer demand for a much higher degree of truth in advertising and for a closer relationship between price and quality.

Consumers' Cooperation.—Consumers may attack the problem of quality and price in still another way, by purchasing goods through their own retail outlets. The movement has reached large proportions in many European countries and is to be found in a number of American communities. In the famous Rochdale system in England the consumers own and operate not only their own retail stores but also many manufacturing plants. Thus they can be assured of the quality of the goods they buy. In addition, they often may purchase at reduced prices; this reason, indeed, is responsible for the establishment of most cooperatives. The distinguishing features of the cooperative type of organization have been discussed in the chapter on business units; it is sufficient at this point to indicate that the consumer's problem may be susceptible of solution by this means.

Leisure and Consumption.—The discussion of standards of living in Chap. II indicated the significant place of *leisure time* in consumption. We are interested not only in the use of goods

and services but also in the freedom from labor necessary to the complete enjoyment of the good things of life.

Leisure may be regarded in any one of three ways. It may be considered merely as a concession to nature, an intermittently unproductive period of recuperation necessary for men, animals, and even machinery. Leisure, from this viewpoint, has no value except as it prepares for a further period of productive activity. On the other hand, leisure may be considered as an end in itself, a recognized career, perhaps. This is likely to be the viewpoint of a people overburdened with toil, who might well set up, as the most desirable existence of which they could conceive, a heaven wherein those who have departed this wearisome life would no longer be required to work at all. As a middle ground between these two extreme viewpoints we have a third possibility, namely, that leisure is an essential element in any well-rounded and complete life. Thus too much leisure would be considered as great a burden as the entire lack of this necessary item in any standard of living. Hence, in the words of the nursery rhyme:

All work and no play makes Jack a dull boy,
All play and no work makes Jack a mere toy.

Figure 12 shows the movement toward a shorter working day in the United States. Since the working day is undergoing curtailment and the amount of leisure is increasing correspondingly, the question of what to do with the additional spare time becomes an important one. The numerous welfare activities of many corporations present a useful outlet for much idle time. Furthermore, the opportunities for adult education provide, for many people, a desirable diversion from their customary routine.

There are also vicious ways of utilizing spare time, it is true, but to say that leisure is bad merely because a few individuals misuse it is a very unfair way of judging the question. After all, but one criterion seems justified in economics, and that is expressed by the phrase "the greatest good for the greatest number." Viewed in this light, the misuse of leisure by a few persons pales into insignificance beside the much greater number using it for educational purposes and for the enjoyment of those goods which require spare time for their utilization (see Prob. 83).

Changes in Consumption. Styles and Fashions.—Changes in consumption are of two main types. Of these, one is to be

found in the relatively temporary changes sometimes called "styles." Careful students of the subject, however, insist that we should take pains to distinguish between style and "fashion." Strictly speaking, a style is a particular design. Thus the Gothic is one style of architecture; the four-door sedan, one style of automobile coach work; the sun-tan back, one style of women's clothing. If a given style is in demand by many persons, that style is then the fashion. When King Tutankhamen's tomb was opened, certain Egyptian styles, presumably at one time fashion-

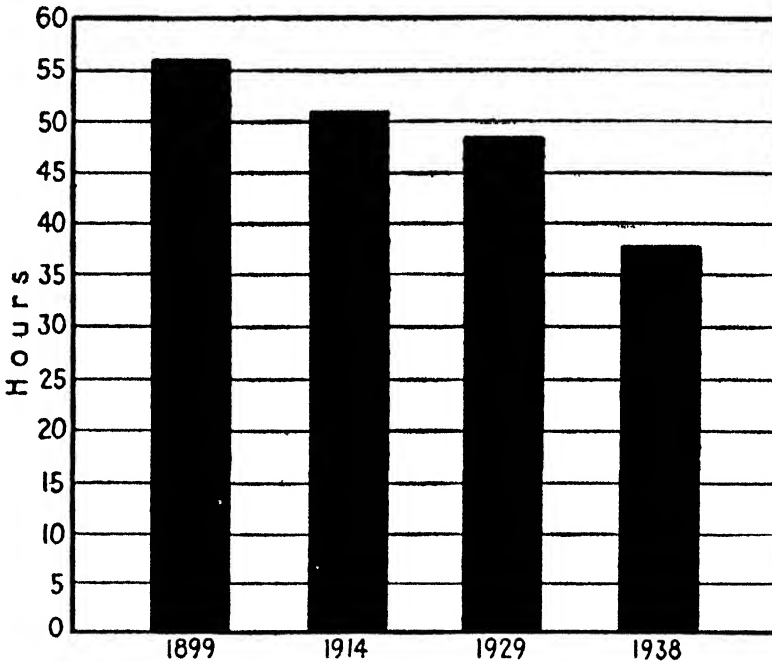


FIG. 12.—Average number of hours per full-time week in manufacturing industries.¹

able in ancient Egypt, became fashionable again in the present-day world.

The most noticeable changes in consumption, then, are fashions, the changes occurring most frequently being in such lines as women's apparel. Thorstein Veblen has presented an interesting explanation of this situation. He points out in his "Theory of the Leisure Class"² that rivalry and personal competition, instilled in all of us almost from infancy, are at present largely conducted on a monetary basis. The most successful person is

¹ National Industrial Conference Board, and U. S. Bureau of Labor Statistics.

² VEULEN, THORSTEIN, "Theory of the Leisure Class," Vanguard Press, Inc., 1927.

the man who acquires the greatest fortune. Since businessmen of today must spend much of their time in trying to amass such fortunes, the task of indicating to all the world the degree of success achieved falls upon their wives. Hence it is fashionable for such women to do as little productive work as possible. Instead they spend time in the conspicuous consumption of wealth. For this reason expensive cars, liveried servants, costly mansions, and fashionable clothing are desired as a means of pecuniary emulation, showing the husbands' financial ability at least to "keep up with the Joneses."

One method of indicating this financial superiority is that of dressing always in the latest fashion. If fashions change so rapidly that the old articles obviously cannot have been worn out when replaced by new ones, pecuniary emulation is thereby aided to no small degree. Since nearly everyone is striving to reach the same goal, whatever the rich do is promptly copied by the middle and lower income classes, however little they can afford it, whereupon the rich must needs take up another style in order to be different. Considered from the material viewpoint, this process is highly inefficient, since the goods purchased are not fully utilized before others are demanded. If there were sufficient goods to supply the needs of all people, this waste would be of minor importance, but owing to the sadly inadequate standards of living of a large part of the population, these losses actually are of major significance.

Inventions.—The second main type of change in consumption may be seen in the gradually rising standards of living of all people the world over. The discovery of steam and electric power, the improvement in methods of communication and transportation, the constant development of new products and of cheaper methods of production, for instance, have all, over a period of years, aided in raising the standard of living of every class of people. One of the real opportunities for the engineer to be of service to humanity is found in the hastening of such improvements, for they are of the greatest benefit to society since they increase the productivity of the whole economic system.

Present Status of Consumption.—It is a commonly accepted fact that the standard of living in the United States is the highest in the world. This preeminent position of the American consumer may be indicated in general terms by the following excerpts

from the remarks of a Frenchman after a lengthy visit to the United States:¹

Great riches and great poverty are identical in their manifestations everywhere, so I shall not consider now how the very wealthy or the utterly destitute exist. Nor shall I speak of the staggering superiority of the number of car owners, radio owners and telephone subscribers in America compared with those in Europe. More significant than all that is the profound difference between the common facilities of living offered to the average purse in the United States and those offered to the average purse in Europe.

Spending about the same amount of money (at normal rates of exchange), Europeans still live half barbarically, with an enormous expenditure of manual labor, time, and trouble, while the American citizen lives comfortably and smoothly with a minimum of wearing, complicated, and dirty toil. . . . A stupendously greater proportion of people in America have the opportunity to live like rational, clean and cultured human beings, and not like grimy, dreary, exhausted drudges, than anywhere else on earth.

Although the American consumer, on the average, is in a favored position, an appallingly large number of American families have inadequate standards of living. Thus in 1929 families were classified, in terms of annual income, as follows:

Annual income		Millions of families	Percent of all families
Under	\$ 1,000....	6.0	21.0
\$ 1,000 to	1,500....	6.0	21.0
1,500 to	2,500 ...	8.0	28.0
2,500 to	5,000....	6.6	22.0
5,000 to	10,000....	1.4	5.7
10,000 and over	.....	0.6	2.3

Since a bare "living standard" requires an annual income of \$1,500 to \$1,800, depending upon the locality, the size of family, and so on, it is evident that almost half our population is confined to a substandard level of consumption. This fact is illustrated also by the data in Table 16.

The lowest income group spent 97 percent of its income on food, housing, transportation, clothing, and personal expenditures

¹ Odette Keun, *New York Times Magazine*, Aug. 8, 1937.

TABLE 16.—EXPENDITURE BUDGETS OF AMERICAN CONSUMERS, BY GROUPS, 1929*

Income group	Portion of expenditure for:											
	Food	Hous- ing	Trans- porta- tion	Cloth- ing	Per- sonal	Sav- ings	Civil (Fees and costs)	Recre- ation	Health	Social activi- ties	Edu- cation	Direct taxes
Under \$ 1,000.....	33.5 %	18.5 %	14.4 %	11.6 %	9.0 %	2.7 %	2.4 %	2.3 %	2.2 %	1.5 %	1.1 %	0.8 %
\$ 1,000 to \$ 2,000.....	32.2	15.8	15.8	10.8	8.8	4.8	1.4	3.2	2.5	2.1	1.7	0.9
2,000 to 3,000.....	20.7	14.3	16.0	10.1	12.8	10.6	0.8	5.3	3.0	2.2	2.5	1.7
3,000 to 5,000.....	14.8	17.4	10.8	8.3	13.6	16.2	0.2	7.5	5.0	1.5	2.9	1.8
5,000 to 10,000.....	10.4	24.4	8.8	6.4	15.8	14.0	0.2	9.5	3.2	1.6	3.2	2.5
1,000,000 and over.....	0.2	1.8	0.2	0.1	0.2	76.5	0.1	0.6	0.1	2.7	0.4	17.2

* "The American Consumer Market." A Study by *The Business Week*, McGraw-Hill Publishing Company, 1932.

(such as tobacco, liquor, and personal adornment), while the highest income group was able to spend only about 6 percent of its income on consumption goods and saved most of the remainder for reinvestment.

The Postwar Consumer Market.—A survey of recent changes in consumption may be introduced by an examination of the general classes of goods consumed in the United States.

TABLE 17.—THE AMERICAN CONSUMER MARKET, 1921, 1925, AND 1929*

Commodity group	Expenditure, millions			Percent of total		
	1921	1925	1929	1921	1925	1929
Food.....	\$18,036	\$21,807	\$ 24,392	26.9	25.3	23.0
Housing.....	12,948	15,961	18,337	19.3	18.5	17.3
Clothing.....	7,923	9,341	9,313	11.8	10.8	8.8
Transportation.....	7,110	11,247	13,815	10.6	13.0	13.0
Personal.....	6,610	8,213	10,497	9.9	9.5	9.9
Savings.....	5,371	7,446	12,650	8.0	8.6	11.9
Health.....	2,104	2,847	3,776	3.1	3.3	3.6
Direct taxes....	2,033	2,282	2,685	3.0	2.6	2.5
Recreation.....	1,750	3,054	5,250	2.6	3.5	4.9
Education.....	1,251	1,718	2,308	1.9	2.0	2.2
Social activities....	1,224	1,530	2,030	1.8	1.8	1.9
Civil (Fees and costs).....	640	836	1,155	1.1	1.1	1.0
Total.....	\$67,000	\$86,282	\$106,101	100.0	100.0	100.0
Population.....	108.2	114.8	121.5			
Per capita.....	\$ 619	\$ 752	\$ 873			

* "The American Consumer Market," A study by *The Business Week*, McGraw-Hill Publishing Company, 1932.

The relocation of consumer emphasis in the nine years covered by the table is evident. The outstanding change was the 90 percent relative increase in expenditures for recreation, which reflects the rapid growth between 1921 and 1929 of commercial recreation, such as movies and football. The portion of the national income "saved" increased by 40 percent in part because of an overstimulated stock market, and the relative expenditure for transportation increased 23 percent as a result of the rapid expansion of the automobile industry after 1921. In the same period the relative expenditure for housing declined 11 percent, for food 14 percent, for direct taxes 17 percent, and for clothing 25 percent.

Many changes occurred within these broad commodity groupings. Thus we may note, under the heading of clothing, a reduction in the sale of yardage goods of over 60 percent and of men's clothing of 1 percent, while sales of women's clothing increased 56 percent. Although the portion of the national income allotted to personal expenditure remained unchanged, the expenditure for personal adornment such as cosmetics increased 100 percent. Social activities similarly show wide internal fluctuations although the same portion of the national income was devoted to this purpose

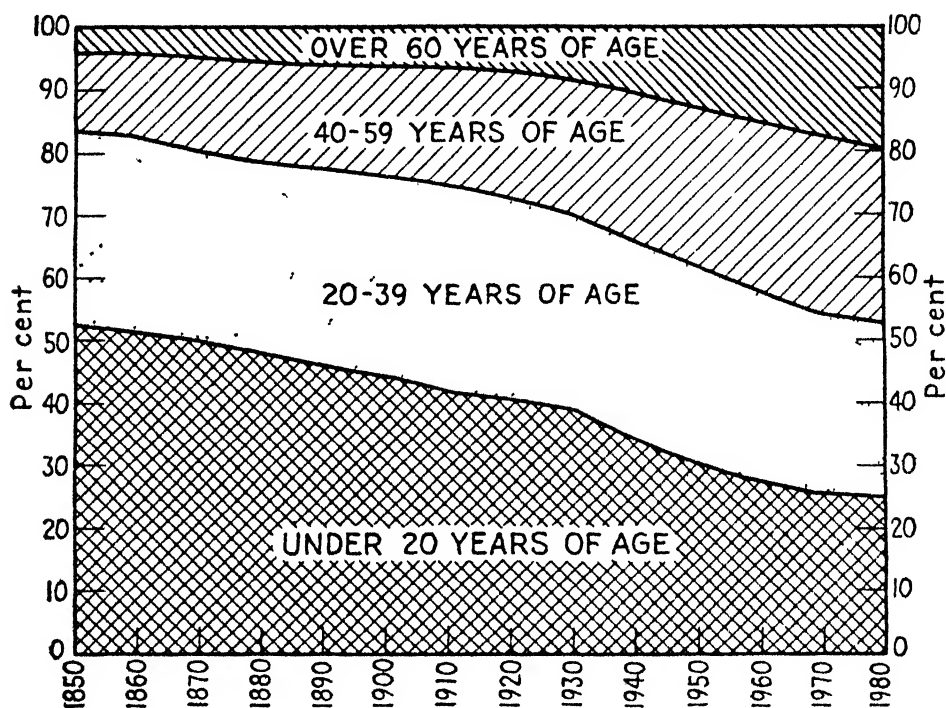


FIG. 13.—America's aging population.¹

each year. Thus expenditures for religious organizations and civic associations suffered a decline of 19 percent. The portion of the consumers' money spent for goods has declined from 68 percent to 60 percent since the war and the portion spent for services has as steadily increased, so that the time may come, and in the not distant future, when less than half the consumers' dollar will be available for the purchase of actual commodities.

Finally, we may note a very significant change in the population itself which will have the most far-reaching effects upon investment, production, and consumption. As the birth rate continues

¹ From computations and estimates made by the U. S. Department of Agriculture.

to decline the nation approaches a stationary population or, if the birth rate falls below the death rate, a declining population. While a population is growing the percentage of young persons is much larger than when the population declines. Clearly the kind of goods desired, as wheel chairs in place of baby buggies, for example, is vitally affected by the age constitution of the population, as is the need for such types of investment as life insurance and old age pensions. Thus future problems of consumption are certain to be affected by birth and death rates as well as by new inventions and new fashions.

Problems

81. "To increase consumption on the part of the people as a whole we must first increase production. Goods, after being produced, will be generally shared. The rich people won't spend much more than before, so the less fortunate people will be bound to gain." Argue for and against this statement.

82. In terms of Table 14, p. 216, suppose a consumer is able to purchase six articles. How will he divide his purchases between *A*, *B*, *C*, and *D*? Why? Suppose he buys twelve articles?

83. "People today always want money and more money, whereas true happiness is found only in spiritual wealth. If people had more money, they would merely squander it trying to live above their station in life, trying to get something for nothing. Americans have lost some of the sturdy qualities of their hard-working forefathers. As wealth accumulates, men decay. The people are too prosperous; that's what's the matter." Do you agree? Why?

84. Construct a budget for yourself in anticipation of your income and expenditure 3 years after graduation. What changes might be expected 10 years later?

85. Do you think a government should inform its citizens as to the "best" clothes, candy, bread, shaving soap, tires, and fountain pens they should buy? Why?

86. Is a chemical engineer justified in concocting a preparation at a cost of a nickel a package which will be sold for a dollar?

References

CARVER, T. N.: "The Economy of Human Energy," The Macmillan Company, 1924.

CHERINGTON, PAUL T.: "People's Wants and How to Satisfy Them," Harper & Brothers, 1935.

EZEKIEL, MORDECAI: "\$2500 a Year," Harcourt, Brace & Company, 1936.

FORMAN, CLARK, and MICHAEL ROSS: "The Consumer Seeks a Way," W. W. Norton & Company, 1935.

FOWLER, BERTRAM B.: "Consumer Cooperation in America," Vanguard Press, Inc., 1936.

KALLET, ARTHUR, and F. J. SCHLINK: "100,000,000 Guinea Pigs," Vanguard Press, Inc., 1933.

LAMB, R. F.: "The American Chamber of Horrors," Farrar & Rinehart, 1936.

NYSTROM, P. H.: "Economic Principles of Consumption," Ronald Press Company, 1929.

PHILLIPS, M. C.: "Skin Deep," Vanguard Press, Inc., 1934.

WYAND, CHARLES S.: "The Economics of Consumption," The Macmillan Company, 1937.

ZIMMERMAN, C. C.: "Consumption and Living Standards," D. Van Nostrand Company, Inc., 1936.

CHAPTER XIII

FACTORAL PROPORTION

Management is concerned primarily with the problem of determining the most efficient combination of the various factors of production to be utilized in a going concern under given market conditions. Thus the business manager attempts to find the quantities of land, labor, buildings, machinery, raw materials, and supplies, for example, that will be most efficient in the production of radio sets, or of motorcars, or of telephone service.

The fundamental problem of the proportion of factors to be utilized in business activity is composed of three parts. First, the relationship between the physical units of productive factors and the physical units of output must be understood. Second, the money costs of the various factors of production must be considered in order to determine the unit money cost of the product. Third, the state of the market for the commodity produced plays a very important part in determining the actual conditions under which production will take place. The market condition is affected by the cost analysis, which in turn is based upon the physical analysis. Many people, however, fail to appreciate the fact that the problem includes anything more than monetary cost items alone.

I. PHYSICAL OUTPUT

Non-proportional Physical Output.—The outstanding characteristic of the economic phenomena we are about to consider is the fact that a given result usually may be obtained in more than one way. In this respect these phenomena are markedly different from many examples in physics, chemistry, or engineering. In these fields the output obtained from a process may be strictly proportional to the inputs utilized. The current flowing through a given conductor is exactly proportional to the voltage, and the weight of H_2O obtained when hydrogen and oxygen are combined to form water is just proportional to the weights of the gases used.

This direct relationship is the exception rather than the rule, however, in the data given below. Thus a carburetor may be adjusted to a lean or a rich mixture, yet the motor will continue to run; a farmer may fertilize his fields lightly or heavily, yet he will still obtain a crop; the industrial chemist may combine some ingredients in various proportions and still secure the desired product. Thus the *amount* of product is not always directly proportional to the quantity of input factors used. Let us consider ethyl acetate as an example. It is an important constituent of certain automobile lacquers and paints and is obtained from a mixture of acetic acid and ethyl alcohol. If we let x = the amount of ethyl acetate produced, we may calculate outputs by equation (10)

$$\frac{x^2}{(\text{acid} - x) \cdot (\text{alcohol} - x)} = 3.91 \quad (10)$$

from the quantities of acid and alcohol used. In this way the data for Table 18 were derived.

TABLE 18.—NON-PROPORTIONAL PHYSICAL OUTPUT OF ETHYL ACETATE*

Combination	Inputs		Total output, ethyl acetate	Output per unit of	
	Acetic acid	Ethyl alcohol		Acid	Alcohol
<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>
<i>A</i>	237.530	118.765	100	0.420	0.840
<i>B</i>	150.602	150.602	100	0.662	0.662
<i>C</i>	127.737	191.604	100	0.781	0.521
<i>D</i>	118.624	237.248	100	0.840	0.420
<i>E</i>	114.548	286.370	100	0.870	0.350
<i>F</i>	110.988	332.964	100	0.901	0.300

* All figures are in gram-moles.

Column *a* in Table 18 provides a ready means of identifying the various rows of data. Columns *b*, *c*, and *d* are obtained from Equation 10; in the other examples which follow they will be the result of experiment or of assumption. Columns *e* and *f* are computed from the preceding data as indicated by the appropriate heading. The table shows six of the many different ways in which 100 units of acetate may be obtained. Note that a reduc-

tion in the quantity of one input, say acid, is compensated by a marked increase in the other input factor in order that the total output may remain a constant.

One Input Factor Fixed.—In economic analysis, the most common situation is that in which one of the input factors is a constant while the other input factor and the output are variables. It thus differs from Table 18, where both input factors varied and the output was a constant. The conditions in a particular example usually determine which input should be regarded as a constant. Thus an agricultural experiment would consider land as fixed while seed and fertilizer are varied.

The normal case may be derived from Table 18 or from Equation 10 and the data would appear as in Table 19. This example also is one of non-proportional output, for the total output of

TABLE 19.—OUTPUT OF ETHYL ACETATE WITH ACETIC ACID CONSTANT*

Combination	Inputs		Output, acetate	Output per unit of		Gross marginal output
	Acid	Alcohol		Acid	Alcohol	
<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>
<i>A</i>	100	50	42.1	0.421	0.842	24.3
<i>B</i>	100	100	66.4	0.664	0.664	12.2
<i>C</i>	100	150	78.2	0.782	0.515	6.1
<i>D</i>	100	200	84.3	0.843	0.422	3.0
<i>E</i>	100	250	87.3	0.873	0.349	2.8
<i>F</i>	100	300	90.1	0.901	0.300	1.4
<i>G</i>	100	350	91.5	0.915	0.261	1.3
<i>H</i>	100	400	92.8	0.928	0.232	

* All figures are in gram-moles.

acetate does not increase in proportion to the inputs of alcohol. Thus the increase from 50 to 100 in column *c*, combinations *A* and *B*, is 100 percent. If the output increased in proportion, the value in column *d*, combination *B*, would be 84.2 (42.1×2). It is only 66.4, so the increase in output was *less than proportional* to the increase in input. This relationship continues throughout the table, but this example is unusual in that other relationships, shown in later tables, do not appear at all in this case.

Marginal Output.—Column *g* did not appear in the previous table because output there was a constant. Here it is a variable

and the marginal output, or *marginal product* as it is often called, can be determined. The term "marginal" is a very common one in economics and has reference to the items "on the edge." In this case the marginal output refers to the *first differences* of column *d*: the amount by which the total output is increased from one combination to the next. Thus in combination *E*, 3 units are marginal since they are on the edge, so to speak, and disappear if we return to the output in combination *D*. Column *g* therefore shows that total output is increasing at a diminishing rate; in other words, the curve of output is asymptotic and approaches a maximum value. If the data were for combinations beyond that point, the marginal outputs would be negative (see Table 20).

Application to Mechanics.—A more complete example of the fundamental physical relationship with which we are concerned

TABLE 20.—RELATION OF FUEL MIXTURE TO POWER DEVELOPED BY AN INTERNAL COMBUSTION MOTOR*

Combination	Input (needle valve adjustment)			Output (delivered horsepower)		Output per unit of		Gross marginal output
	Lb. dry air	Lb. gaso-line	Ratio of air to gaso-line	Total output	Proportional output	Air	Gas	
<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>	<i>h</i>	<i>i</i>
<i>A</i>	100	4.7	21:1	1.20	.....	0.0120	0.2553	
<i>B</i>	100	5.0	20:1	1.45	1.277	0.0145	0.2900	0.25
<i>C</i>	100	5.3	19:1	1.65	1.537	0.0165	0.3113	0.20
<i>D</i>	100	5.6	18:1	1.77	1.743	0.0177	0.3161	0.12
<i>E</i>	100	5.9	17:1	1.85	1.865	0.0185	0.3136	0.08
<i>F</i>	100	6.3	16:1	1.92	1.975	0.0192	0.3048	0.07
<i>G</i>	100	6.7	15:1	1.96	2.042	0.0196	0.2925	0.04
<i>H</i>	100	7.1	14:1	1.98	2.077	0.0198	0.2789	0.02
<i>I</i>	100	7.7	13:1	1.99	2.147	0.0199	0.2584	0.01
<i>J</i>	100	8.3	12:1	1.96	.....	0.0196	0.2361	-0.03
<i>K</i>	100	9.1	11:1	1.90	.....	0.0190	0.2088	-0.06

* Delco light motor at 1,060 revolutions per minute; H. M. JACKLIN, *Effects of Multiple Ignition on the Performance of a Small Engine*, *Bulletin 45*, p. 13, Engineering Experiment Station, Ohio State University, 1928.

may be found in experiments on the performance of gasoline engines. Such an example appears in Table 20. The various columns are similar to those in the preceding tables with two exceptions. Column *d* shows the *ratio* of the fixed input to the variable input, the ratio of air to gasoline, which was changed step by step throughout the experiment. Also column *f* in Table 20 shows the output *to be anticipated* if total output increased *in proportion* to the gasoline inputs. The *actual* increase in total output was *more than proportional* in combinations A to D and *less than proportional* from combination E to combination I. After that point total output declined as the fuel mixture became too rich.

Theoretical Example.—While experimental data demonstrate the truth of the principles now to be discussed, they almost never

TABLE 21.—THEORETICAL EXAMPLE OF NON-PROPORTIONAL OUTPUT

Combination	Inputs		Total output	Output per unit of input		Marginal output
	Fixed	Variable		Fixed	Variable	
<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>
A	5	1	0	0	0	0
B	5	2	0	0	0	24
C	5	3	24	4.8	8	40
D	5	4	64	12.8	16	46
E	5	5	110	22.0	22	34
F	5	6	144	28.8	24	31
G	5	7	175	35.0	25	25
H	5	8	200	40.0	25	25
I	5	9	225	45.0	25	25
J	5	10	250	50.0	25	14
K	5	11	264	52.8	24	12
L	5	12	276	55.2	23	10
M	5	13	286	57.2	22	8
N	5	14	294	58.8	21	6
O	5	15	300	60.0	20	0
P	5	16	300	60.0	18.75	0
Q	5	17	300	60.0	17.65	-12
R	5	18	288	57.6	16	-30
S	5	19	258	51.6	14	-58
T	5	20	200	40.0	10	

provide examples showing all the possible variations that may be found. For this reason the following discussion will be based upon the theoretical example given in Table 21 so that all the possible variations may be noted. The data in columns *b*, *c*, and *d* are assumed; the remaining figures are calculated from these three columns.

The Six Stages of Output.—The student should be quite familiar with the relationships shown in this table, for they are fundamental to an understanding of many economic problems. The data in columns *e* and *f* evidence a peculiar behavior. In terms of the *average outputs* of columns *e* and *f*, we may divide the table into *six stages of output*. Thus combinations *A* and *B* represent a stage of *no output*. Combinations *B* to *G* inclusive show a stage of *more-than-proportional output*, since *both* averages increase together. When the average in column *f* increases it means that total output is increasing more than proportionally compared with the variable-input factor. Combinations *G* to *J* inclusive represent the stage of *proportional output*, since the average for the variable factor is a constant, indicating that output increases in exact ratio with the variable-input factor. Combinations *J* to *O* inclusive mark the stage of *less-than-proportional output*. Here the average for the fixed-input factor increases, showing a rising total output, at the same time that the average for the variable-input factor declines, showing that total output is growing more slowly than this factor. Combinations *O*, *P*, and *Q* show a stage of *constant total output* since the average for the fixed-input factor is a constant. Finally, combinations *Q* to *T* inclusive indicate the stage of *decreasing total output*, since both averages are declining.

The terms used are novel, for most writers speak of only two or three stages, and in the following terms: The stage of *increasing returns* is that of more-than-proportional output; the stage of *diminishing returns* refers to less-than-proportional output; and the stage of *decreasing returns* is our stage of decreasing total output. All six stages probably never appear in any one experiment in real life. The most common stages are more-than-proportional output, less-than-proportional output, and either constant total output or decreasing total output. Occasionally we may find a case, however, where only proportional output and constant total output appear.

Significant Combinations.—Certain combinations are more significant than others, for in them one of the series of data reaches a maximum or minimum value. Thus combination *D-E* marks the *maximum marginal output*. Again, combination *J* (in the absence of a stage of proportional output) marks the maximum average for the variable-input factor, the *variable optimum* point. Note that the marginal-output data are *always* smaller after this point than are the variable-average data. Finally, combination *O* (in the absence of a stage of constant total output) marks the maximum average for the fixed-input factor, the point of *fixed*

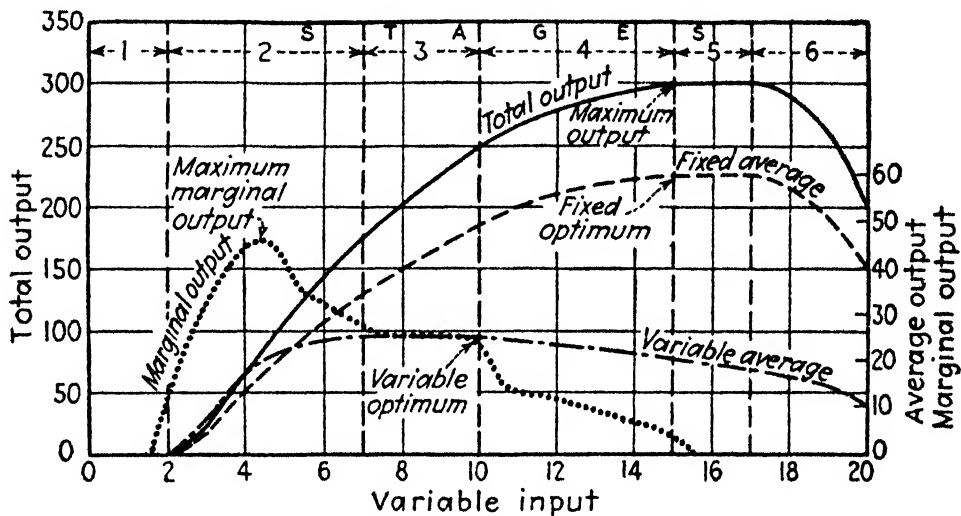


FIG. 14.—Six stages of output from Table 21.

optimum, as well as the *maximum total output*. These significant points are shown in Table 21 by figures in boldface type. Their relationships may be understood more readily, perhaps, by reference to Fig. 14, where the data in columns *d*, *e*, *f*, and *g*, are plotted.

The Law of Non-proportional Output.—The relationships just discussed are typical of the great majority of cases of physical production. We may summarize the relationships in a statement of the *law of non-proportional output* as follows:

As a fixed quantity of one factor of production is combined with an increasing amount of another factor, the physical output obtained will not continuously be in proportion to the inputs utilized.

The second section of this chapter will indicate the particular significance of the fourth stage of output, namely, the stage of less-than-proportional output. This group of combinations is

so important that we should do well to keep in mind a definition for the stage. We may call it the *principle of less-than-proportional output*. It is frequently designated as the "law of diminishing returns," and may be stated thus:

As a fixed quantity of one factor of production is combined with an increasing amount of another factor, the total physical output will increase simultaneously with an increasing average output for one input factor and a decreasing average for the other input factor.

The behavior of the two average outputs is the characteristic which marks off this stage from the others. Indeed, this definition is applicable also to the first example given, Table 18, in which total output was a constant. In that example, all the combinations were in the stage of less-than-proportional output, since one average output increased while the other decreased.

Basic Assumptions.—These statements of economic principles rest upon two basic assumptions which must be understood if the laws are to have validity. First, all new inventions and discoveries, all changes in the arts, and all new ways of carrying on production must be excluded from the experiments from which the data are derived. This assumption is self-evident in the case of the gas engine, but it requires care to make sure that an agricultural experiment, for example, is free from these random elements. Thus changes in seed or fertilizers may conceal entirely the real relationship between cultivation and crop yield.

Second, the passage of time during the experimentation is to be considered undesirable, largely for the same reason. Thus the various combinations in any one of the preceding tables are to be interpreted as the results of *simultaneous* experiments, so that random variations due to weather changes or other modifying events may be excluded.

The "Technologically Best" Combination.—An inspection of Table 21 will indicate that the variable factor is utilized most efficiently in combinations *G* to *J*, where its average output is at a maximum. The fixed factor, on the other hand, reaches its highest efficiency in combinations *O* to *Q*. Which combination in the table is the *best* one from the viewpoint of greatest technological efficiency? A definite answer cannot be given, because there are *two* "best" combinations of physical output. We cannot choose between them on purely physical terms, and we cannot average them because the fixed and variable factors represent

totally different things. A solution for this question can be obtained only if we have some method by which to measure the relative significance of the two factors in terms of a common denominator. This method we shall now examine.

II. LEAST COST

Money Cost.—In order to combine the dissimilar physical units of the fixed and variable factors, each factor must be weighted in some way that is consistent with its importance. Since the business manager is concerned primarily with dollars and cents, the prices of the factors may be used as weights. Suppose each unit of the fixed factor costs \$10 and each unit of the variable factor costs \$3. We now may express the physical averages for the two factors in terms of *average costs* for the two factors and, since these units are comparable, they may be added to obtain the total money *unit cost* for each combination of fixed- and variable-input factors. A portion of these average and unit costs appears in Table 22, in which are included the combinations showing less-than-proportional output.

TABLE 22.—SELECTED AVERAGE AND UNIT COSTS FROM TABLE 21 WHEN *F* COSTS \$10 AND *V* COSTS \$3

Com- bina- tion	Inputs		Total output	Average output		Cost		
	Fixed	Vari- able		Fixed	Vari- able	<i>F</i> aver- age	<i>V</i> aver- age	Unit
<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>	<i>h</i>	<i>i</i>
<i>I</i>	5	9	225	45.0	25	\$0.2222	\$0.1200	\$0.3422
<i>J</i>	5	10	250	50.0	25	0.2000	0.1200	0.3200
<i>K</i>	5	11	264	52.8	24	0.1894	0.1250	0.3144
<i>L</i>	5	12	276	55.2	23	0.1812	0.1304	0.3116
<i>M</i>	5	13	286	57.2	22	0.1748	0.1364	0.3112
<i>N</i>	5	14	294	58.8	21	0.1700	0.1429	0.3129
<i>O</i>	5	15	300	60.0	20	0.1667	0.1500	0.3167
<i>P</i>	5	16	300	60.0	18.75	0.1667	0.1600	0.3267

The data in column *g*, Table 22, are obtained when the cost (\$10) of the fixed-input factor is multiplied by the number of units (5) of that factor and the result (\$50) is divided by the number of units of output in the various combinations. The

lowest average cost for the fixed factor appears in the combinations which show the highest average output for that factor. In other words, the lowest average cost for the fixed factor is synonymous with the highest technical efficiency for that factor. The same statement is true of the variable factor. Thus the least average cost points for the two factors appear, one at the beginning and the other at the end, of the stage of less-than-proportional output (combinations *J* and *O*).

The addition of the data in columns *g* and *h* yields the total money unit costs of column *i*, whose lowest value appears in combination *M*. This is the *least-cost combination*. The actual point of least cost, of course, is somewhere between combinations *L* and *M*, but if the input factors are "indivisible" so that we cannot use fractions of a unit, we shall say that the point falls in the latter combination. Operation should occur here, and only here, if lowest cost at the given prices is desired. Note that the least unit-cost point can be found *only* in combinations between the two least average cost points, as shown in Table 22. This fact will be explained more fully in the sections which follow.

Ordinarily, the computation of unit costs and the location of the least-cost point may be carried through much more rapidly if a short-cut method is used. In this method *total cost* in each combination is determined, and this value is divided by the total output in that combination. The short-cut method will be used in the discussion which follows in this and later chapters.

Location of the Least-cost Point.—A very important relationship is that which exists between the point of least cost and the six stages of output. We find that the point of least money cost *must always* appear in the stage of less-than-proportional output, as we have defined that stage. To demonstrate this fact, we assume, first, that the price of the fixed-input factor is reduced from \$10 to 1 cent while the cost of the variable factor remains at \$3; and, second, that the cost of the fixed factor is \$10 and that of the variable factor is reduced to 1 cent. The significant data appear in Table 23.

The stage of less-than-proportional output is bounded by combinations *J* and *O*, the variable and fixed optimum points, and the point of least cost always appears within these limits. When the fixed-input factor is relatively cheap as compared with the variable factor—as when *F* costs 1 cent and *V* costs \$3—we

TABLE 23.—TOTAL AND UNIT COSTS FROM TABLE 21 WITH SELECTED COSTS

Com- bina- tion	Inputs		Total out- put	Cost <i>F</i> @ \$10; <i>V</i> @ \$3		Cost <i>F</i> @ 1¢; <i>V</i> @ \$3		Cost <i>F</i> @ \$10; <i>V</i> @ 1¢	
	Fixed	Vari- able		Total	Unit	Total	Unit	Total	Unit
<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>	<i>h</i>	<i>i</i>	<i>j</i>
<i>I</i>	5	9	225	\$77	34.22¢	\$27.05	12.022¢	\$50.09	22.262¢
<i>J</i>	5	10	250	80	32.00	30.05	12.020	50.10	20.040
<i>K</i>	5	11	264	83	31.44	33.05	12.519	50.11	18.981
<i>L</i>	5	12	276	86	31.16	36.05	13.062	50.12	18.159
<i>M</i>	5	13	286	89	31.12	39.05	13.654	50.13	17.528
<i>N</i>	5	14	294	92	31.29	42.05	14.303	50.14	17.054
<i>O</i>	5	15	300	95	31.67	45.05	15.017	50.15	16.716
<i>P</i>	5	16	300	98	32.67	48.05	16.017	50.16	16.720

wish to *economize* in the use of the expensive factor. Thus we use that quantity of it which corresponds to the variable-input optimum. If we used less, its average output would decline, its average cost therefore would rise, and operation would be less economical. If we used more, its average output again would decline, owing to the law of less-than-proportional output, and operation would be less economical. Therefore the lowest cost would appear in combination *J*, but *never* before the point which this combination represents.

When the variable-input factor is relatively inexpensive as compared with the fixed factor—as when *F* costs \$10 and *V* costs 1 cent—we wish to economize in the use of the fixed factor. Hence we operate at the fixed-input optimum where its average output is greatest and its average cost is lowest. Therefore the lowest cost would appear in combination *O*, but *never* after the point which this combination represents. In general, however, *both* input factors will be expensive, so that the least-cost point will fall somewhere between these two optimum points. It will approach the variable optimum as the variable cost rises, and will approach the fixed optimum as the fixed cost rises, but it will never pass outside the limits set by these two points.

Least-cost Location with Constant Output.—The physical output data of Table 18 represented the case in which both input

factors varied while output was a constant. In this constant-output type as well, least unit cost falls in the stage of less-than-proportional output. The only difference from the situation just discussed is the fact that *total* cost also is a minimum in the least-cost combination. Suppose the acetic acid of Table 18 costs \$4.50 per unit and the ethyl alcohol costs \$2 per unit. The total and unit costs of producing ethyl acetate would be as shown in Table 24.

TABLE 24.—TOTAL AND UNIT COSTS FOR CONSTANT OUTPUT FROM TABLE 18

Combination	Inputs		Output, acetate	Cost: acid @ \$4.50; alcohol @ \$2	
	Acid	Alcohol		Total	Unit
<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>
<i>A</i>	237.530	118.765	100	\$1,306.415	\$13.064
<i>B</i>	150.602	150.602	100	978.913	9.789
<i>C</i>	127.737	191.604	100	958.025	9.580
<i>D</i>	118.624	237.248	100	1,008.304	10.083
<i>E</i>	114.548	286.370	100	1,088.206	10.882
<i>F</i>	110.988	332.964	100	1,165.374	11.654

Economic Lot-sizes.—As a typical example of constant output, consider a firm that is to produce automobile castings and that knows in advance approximately the quantity of each type required during the coming year. If we assume that capacity is much greater than the amount to be produced, the question arises: How shall production be distributed? Shall the whole amount be produced with one setup; shall the plant use two setups, one now and one six months hence; shall it use three, or twelve? If it produces all the castings with one setup, there will be but one setup charge. On the other hand, all the material would have to be purchased at once and, since the product is sold uniformly throughout the year, considerable expense will be involved in interest and storage charges, not to mention the relatively large capital requirement.

Consider the other extreme. The plant manager decides to cut down on capital requirements and on storage charges, by producing the article month by month as needed. This procedure,

however, involves twelve setups and leads to a marked increase in this expense. Thus the problem is: What is the least-cost arrangement, considering all the items?

Assign the following values to the various factors: S indicates the cost of one setup, \$150 in this case; i represents the current interest rate, say 6 percent; N represents the number of pieces to be made in the given year, in this case 30,000; C represents the cost per piece, or \$3; and X represents the number of lots to be used. Substituting these quantities in the formula

$$X = \sqrt{\frac{NCi}{2S}} \quad (11)$$

and solving for X gives a value of 4.2. For all practical purposes this may be taken as four lots per year, one setup every three months.

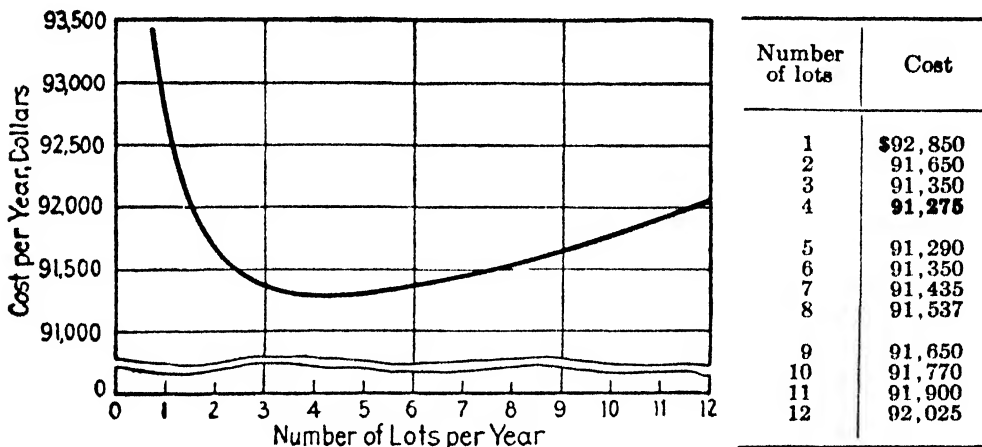


FIG. 15.—Cost curve of lot sizes.¹

Substituting this value of X in the equation

$$K_x = NC + SX + \left(\frac{NCi}{2X}\right) \quad (12)$$

gives the cost K_x with four setups, or \$91,275. Similarly, the cost with one setup would be \$92,850, while with twelve setups it would amount to \$92,025. The typical unit cost curve of Fig. 15 is obtained when these results are plotted.

¹ LEHOCZKY, P. N., The Effect of Time on Production Cost, *Automotive Daily News*, Oct. 7, 1930, p. 4.

A more complete equation, the "Lehoczky formula," for application to this problem is

$$X = \sqrt{\frac{NCi(J + R - RJ) + NSt}{2S}} \quad (13)$$

where X = number of lots to be used during the year.

C = cost per piece of raw material.

i = interest rate per year.

S = cost for one setup.

St = cost of storing the finished product in dollars per piece per year.

J = ratio of output to capacity.

N = output in pieces per year.

R = ratio of cost of finished product to cost of raw material.

The substitution of appropriate values in the equation and the solution for X will give the number of lots which represents the least-cost combination of factors.¹

It is not our purpose to present a detailed discussion of particular problems of factorial proportion in this book. Such a discussion rightfully belongs in the field of engineering. The broad aspects of the problem of non-proportional output are of significance here, rather than the application of this principle to the derivation of formulae for the solution of particular situations, such as those just mentioned. It will here suffice, therefore, merely to indicate that formulae may be derived which will permit the determination of the least-cost combination in the particular cases for which they have been developed, without necessitating the use of the experimental method.

Marginal Cost.—The marginal output was defined as the amount by which total output was increased by the addition of a dose of the variable-input factor in a given combination as compared with the preceding combination. The increase in the variable-input factor entails an increase in cost, unless that factor is entirely free. Therefore we may calculate the *marginal cost*—the cost of producing the *additional* units in a given combination as compared with the foregoing combination. The *increase* in

¹ *Ibid.*; for additional information see JOHN YOUNGER, "Work Routing in Production," Chap. V, Ronald Press Company, 1920; F. E. RAYMOND, Advantages Derived from the Simplification of the Fundamental Formulas for Economic Production Quantities, *Management, Transactions of the American Society of Mechanical Engineers*, Vol. 52, No. 4, January to April, 1930; and P. N. LEHOCZKY, "Quantitative Management," Hedrick, 1935.

total cost from one combination to the next thus is to be divided by the marginal output of the two combinations. The necessary data may be found in Tables 21 and 22, and the marginal costs thus obtained appear in Table 25.

TABLE 25.—MARGINAL COSTS COMPUTED FROM TABLES 21 AND 22

Combi- nation	Inputs		Output		Cost <i>F</i> @ \$10; <i>V</i> @ \$3		
	Fixed	Variable	Total	Marginal	Total	Unit	Marginal
<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>	<i>h</i>
<i>I</i>	5	9	225		\$77	34.22¢	
<i>J</i>	5	10	250	25	80	32.00	12.0¢
<i>K</i>	5	11	264	14	83	31.44	21.4
<i>L</i>	5	12	276	12	86	31.16	25.0
<i>M</i>	5	13	286	10	89	31.12	30.0
<i>N</i>	5	14	294	8	92	31.29	37.5
<i>O</i>	5	15	300	6	95	31.67	50.0
<i>P</i>	5	16	300	0	98	32.67	?

In the stage of less-than-proportional output, marginal cost increases as output grows larger. The lowest marginal cost would appear in combination *D-E* irrespective of prices, for this is the point of maximum marginal output. Before that point marginal cost would decrease as output increases, but in the stage of less-than-proportional output marginal cost *always* increases unless output is a constant or expands at a constant rate. Marginal cost here must be increasing because the growth of total output is asymptotic while the cost of the variable-input factor increases at a constant rate. Since the divisor decreases and the dividend is a fixed value, the quotient must increase.

The most significant fact regarding marginal cost, however, is this: The curve of marginal cost *always* intersects the curve of unit cost at the point of least unit cost. Thus in Table 25 the values in column *h* are less than those in column *g* until combination *M* is passed, whereupon the values in column *h* are greater than those in *g*. There is a definite reason for this relationship. After the variable optimum point has been passed, marginal cost is rising, but if it is still below unit cost the addition of further units of input will decrease unit cost. When marginal

cost passes above unit cost, however, this condition is reversed; the addition of another unit of input will add to unit cost because the cost of this particular unit's output—the marginal cost—is greater than the preceding unit cost (see Fig. 16).

More than Two Input Factors.—The foregoing discussion has been phrased in terms of two input factors, one of which usually was regarded as fixed while the other was a variable. Actually, a large number of input factors may be found in practice, but they will be of only three types. First, if there are a number of fixed factors, the preceding analysis still may be applied, for the fixed

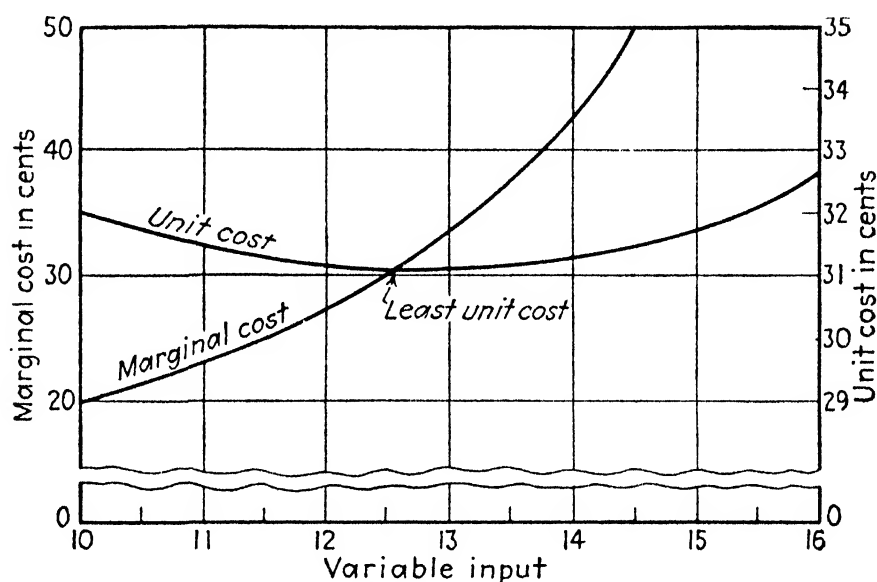


FIG. 16.—Unit cost and marginal cost from Table 25.¹

factors may be lumped together as a unit. Second, some of the input factors may vary in exact relation to the output. Such factors will not alter the general method of analysis, or the conclusions reached, in this section. Third, when more than one independently variable input factor is present, however, we cannot treat the problem in the same way as if it involved only one variable-input factor. These more complicated problems obey the same general principles, and show the same relationships, as do the more simple cases we have discussed but they cannot be analyzed so readily. Although some investigators have found ways of treating them statistically, businessmen continue to rely on cost-accounting methods for the solution of these cases.

¹ The unit cost is plotted on a separate scale to emphasize its U-shape.

Business Practice.—The great complexity of most actual problems in business practice rarely permits the utilization of the general method of analysis presented in this section. Thus businessmen commonly have relied upon the method of trial and error. The manager makes a change in factorial proportion, notes whether his cost-accounting system indicates higher or lower cost, and on this basis proceeds to experiment with further changes. For example:

In one case we found that by using 2 cents more worth of material in a certain small part we were able to reduce the total cost of it by 40 percent. That is, the amount of material under the new method cost about 2 cents per part more than under the old, but the labor was so much faster that, under the new method, the cost which was formerly \$0.2852 was now only \$0.1663—we carry our costs out to four decimals. The new method required ten additional machines, but the saving was nearly 12 cents per part . . . which, on a 10,000 a day production, meant a saving of \$1,200 a day.¹

III. MAXIMUM PROFIT

Competition Assumed.—The analysis of the factors which determine the point at which the *greatest net profit* is secured is much more involved than was the preceding treatment. This situation is due to the wide range of possible market conditions that management may encounter. In order to simplify the treatment as much as possible we shall assume that the producer in question is operating in a highly competitive field. Suppose he is a farmer. No matter what changes in production are undertaken, any one farmer finds that his output has no noticeable effect upon market prices. He may produce much or little, but the price at which he can sell his produce will not be affected. Hence we may assume a constant sales price for such a competitive producer.

Receipts, Cost, and Net Profit.—Assume that the sales price for the total output in Table 25 is 33 cents per unit. When the outputs in the various combinations of the table are multiplied by this unit price we obtain the *total receipts* in those combinations. The deduction of the total costs in those combinations

¹ FORD, HENRY (in collaboration with S. Crowther), "Today and Tomorrow," Doubleday, Doran & Company, Inc., 1926, pp. 62-67.

from the receipts yields the amounts of *net profit* or *loss* obtained. The significant data appear in Table 26.

TABLE 26.—NET PROFIT OR LOSS FROM TABLE 25 WITH SELECTED SALES PRICES

Combi- nation	Total output	Total receipts			Cost		Net profit or loss		
		@ 20¢	@ 33¢	@ 50¢	Total	Unit	@ 20¢	@ 33¢	@ 50¢
<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>	<i>h</i>	<i>i</i>	<i>j</i>
<i>I</i>	225	\$45 00	\$74 25	\$112 50	\$77	34 22¢	-\$32 00	-\$2 75	\$35 00
<i>J</i>	250	50 00	82 50	125 00	80	32 00	- 30.00	2 50	45.00
<i>K</i>	264	52 80	87 12	132 00	83	31 44	- 30 20	4 12	49 00
<i>L</i>	276	55 20	91 08	138 00	86	31 16	- 30 80	5 08	52 00
<i>M</i>	286	57 20	94 38	143 00	89	31.12	- 31 80	5.38	54 00
<i>N</i>	294	58 80	97 02	147 00	92	31 29	- 33 20	5 02	55.00
<i>O</i>	300	60 00	99 00	150 00	95	31 67	- 35 00	4 00	55.00
<i>P</i>	300	60 00	99 00	150 00	98	32 67	- 38 00	1 00	52 00

When the sales price is 33 cents per unit a loss of \$2.75 is sustained in combination *I*, but the remaining combinations of column *i* in Table 26 show a net profit. This net profit is greatest in combination *M*. Thus the point of *maximum profit* is close to the point of least cost when the costs and prices are as shown. This near coincidence, however, will not always appear.

Location of the Maximum-profit Point.—A change in the sales price will affect the location of the point of maximum profit. If the price is raised from 33 cents to 50 cents, the point of greatest net profit is changed from combination *M* to combination *N-O* (see Table 26). On the other hand, if the sales price is reduced from 33 cents to 20 cents, no profit is obtained, and a point of *least loss* appears in combination *J*. If the price is further reduced to 10 cents, the point of least loss will appear in combination *G*.

Therefore we may say that a sales price just equal to unit cost in the least-cost combination will permit operation without profit or loss; receipts exactly balance costs at the least-cost point; and operation before or after this "break-even" point entails a loss. If the sales price exceeds unit cost in the least-cost combination, the producer will obtain a net profit; receipts will exceed expenditures in some combinations; but the *maximum net profit*

will appear *only* at an output *greater* than that at least cost. If the sales price is less than unit cost in the least-cost combination the producer cannot obtain a profit; costs will exceed receipts; and the point of least loss will appear at an output *smaller* than that at least cost. Hence a competitive producer cannot obtain his greatest profit if he operates at his least-cost point, provided he is able to secure any profit at all.

This relationship of net profit to least cost should be thoroughly understood. Figure 17 may be of assistance in this con-

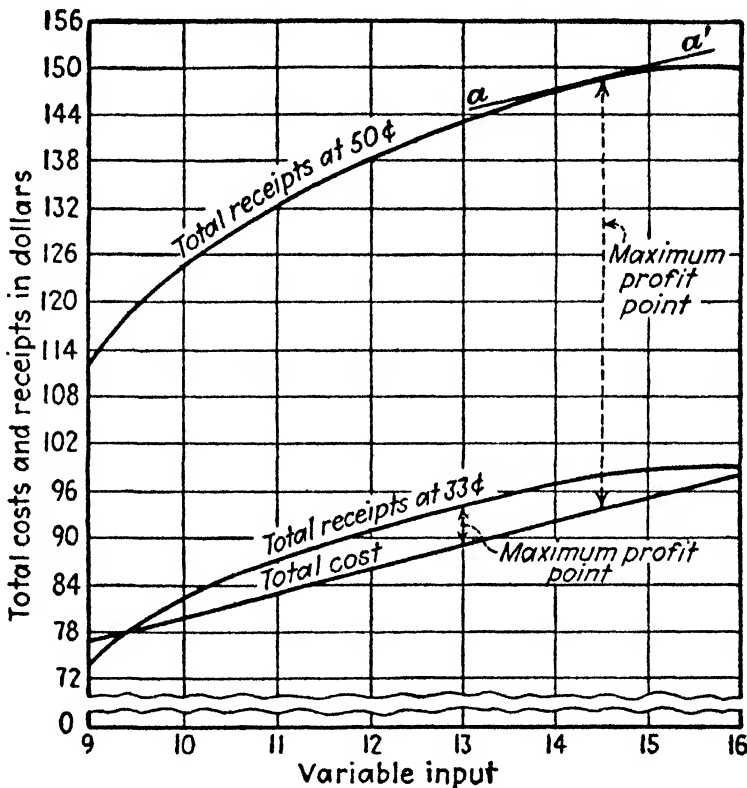


FIG. 17.—Selected total receipts and total costs from Table 26.

nection. The line of total cost, column *f* in Table 26, rises at a constant rate; the lines of total receipts, column *d* or *e*, are asymptotic and reach maximum values in combination *O*, where 15 units of input are utilized. A line drawn tangent to the curve of total receipts will be parallel to the line of total cost, where the distance between these curves is greatest if a net profit is obtained or least if a loss must be sustained. Such a line is shown at *aa'* in Fig. 17. As the sales price is reduced from 50 cents to 33 cents, the curve of total receipts becomes less steep. Thus the tangent line *aa'* must be moved to the left if it is to remain

parallel to the line of total cost. A movement to the left means that maximum profit appears at a smaller output as sales price is reduced.

Relation of Fixed Costs to Net Profit.—The total cost that was plotted in Fig. 17 is made up of two components. One is the *fixed cost* of \$50 which results from the use of 5 units of the fixed-input factor at \$10 each. If this cost were plotted separately in Fig. 17 it would be represented by a horizontal straight line. Thus the *slope* of the cost curve is due solely to the effect of the second component, namely, the *variable cost* which results from the use of different quantities of the variable-input factor at \$3 each. Since it is only the slope of the total cost curve which is significant in respect to the tangent line *aa'* we may conclude that the *amount* of the fixed costs has absolutely no effect upon the *location* of the point of maximum profit. If the fixed cost is large the profit will be small or a loss may appear instead, but the combination of input factors which yields the best point of operation will not be altered by any change in fixed cost which does not change the physical input-factors used.

A numerical example may help to clarify this point. Table 23 showed the total and unit costs when the fixed-input factor cost was reduced from \$10 to 1 cent. If we use these costs in conjunction with the total-receipts data of Table 26, when the

TABLE 27.—NET PROFIT WITH COSTS AND RECEIPTS FROM TABLES 23 AND 26

Combina- tion	Total output	Re- ceipts @ 33¢	Cost <i>F</i> @ \$10; <i>V</i> @ \$3		Net profit	Cost <i>F</i> @ 1¢; <i>V</i> @ \$3		Net profit
			Total	Unit		Total	Unit	
<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>	<i>h</i>	<i>i</i>
<i>I</i>	225	\$74.25	\$77	34.22¢	-\$2.75	\$27.05	12.022¢	\$47.20
<i>J</i>	250	82.50	80	32.00	2.50	30.05	12.020	52.45
<i>K</i>	264	87.12	83	31.44	4.12	33.05	12.519	54.07
<i>L</i>	276	91.08	86	31.16	5.08	36.05	13.062	55.03
<i>M</i>	286	94.38	89	31.12	5.38	39.05	13.654	55.33
<i>N</i>	294	97.02	92	31.29	5.02	42.05	14.303	54.97
<i>O</i>	300	99.00	95	31.67	4.00	45.05	15.017	53.95
<i>P</i>	300	99.00	98	32.67	1.00	48.05	16.017	50.95

sales price is 33 cents, we obtain the results shown in Table 27. The reduction of total fixed cost from \$50 to 5 cents has the effect of moving the point of least cost from combination *M* to *J*, and of increasing the amount of profit received in each combination by \$49.95, but it has no effect at all upon the *point* of maximum profit. This point remains at combination *M*. Therefore fixed costs do not determine the point of greatest net profit; the determination of this point is the result only of the relationship between the *variable* costs and the total receipts.

Relation of Marginal Cost to Net Profit.—The preceding discussion has been phrased in terms of total cost, total receipts, and total net profit. We shall reach the same conclusions if we approach the problem of the most profitable combination from the standpoint of unit, rather than total, figures. Thus we may relate marginal cost to unit sales price.

As long as the marginal cost of producing additional units of output is *less* than the sales price of those units, a net profit will be obtained. When the marginal cost per unit exceeds the price per unit, however, the unit in question will be produced at a loss. Thus the producer will limit his output to that point where marginal cost just equals the sales price. If he produces fewer units, the cost will be less than receipts and he can increase profits by expanding production to the point of balance. If he produces too many units, marginal cost will exceed sales price and his

TABLE 28.—NET PROFIT WITH MARGINAL COSTS FROM TABLE 25

Combination	Marginal		Sales price per unit	
	Output	Cost V @ \$3		
<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>
<i>I</i>			33¢	50¢
<i>J</i>	25	12.0¢	33	50
<i>K</i>	14	21.4	33	50
<i>L</i>	12	25.0	33	50
<i>M</i>	10	30.0	33	50
<i>N</i>	8	37.5	33	50
<i>O</i>	6	50.0	33	50
<i>P</i>	0	?	33	50

profits will be larger if he limits output. The essential data were given in Table 25. When we relate sales prices to these marginal costs, we obtain the figures shown in Table 28.

If the sales price is 33 cents per unit, the point of balance between marginal cost and price is in combination *M*; if the price is 50 cents, the balance occurs in combination *N-O*. These combinations agree exactly with those found in Table 26 when the same situation was analyzed from the viewpoint of maximum net profit. Figure 18 shows this point of balance at the intersection of marginal cost and price. Since marginal cost calcula-

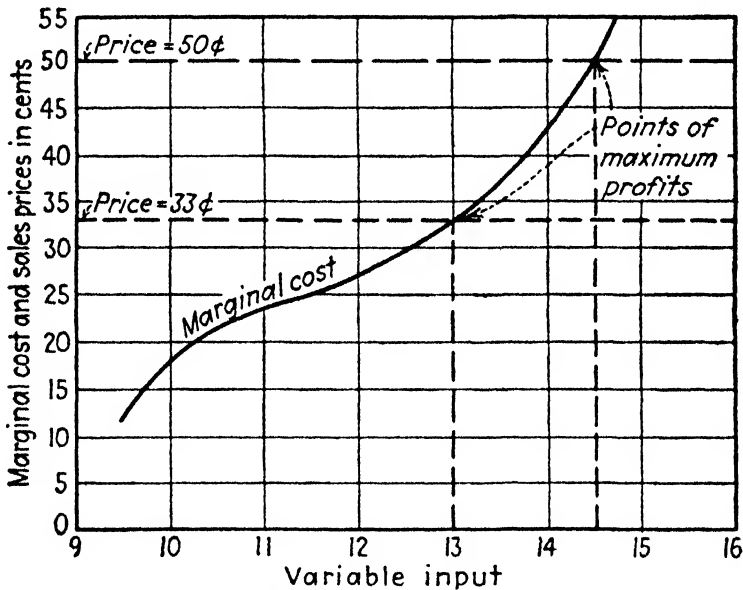


FIG. 18.—Marginal cost, price, and net profit from Table 28.

tions are based on the cost of the variable-input factor alone, fixed or overhead costs play no part in the marginal analysis. The points of maximum profit found in Table 27, and shown in Fig. 18, give no indication whatever of the *amount* of profit secured, or of losses sustained, at those points. The marginal analysis tells us only the *scale of production* at which the plant should operate. We must use the data for total cost and total receipts, or for average cost in relation to marginal cost, if we seek information regarding the success or failure of operation at this best scale of production.

Net Profit When Output is a Constant.—The cost analysis of the case in which both input factors are variables and the output is a constant was given in Table 24. Since *total* cost also is at a minimum in the least-cost combination in this case, we find the

point of maximum net profit *always* in coincidence with the point of least cost. No variation of costs or of sales price will change this coincidence. The marginal cost analysis cannot be applied to this case, however, for output is a constant, and so the marginal output is zero, and marginal cost is indeterminate.

Net Profit When Output Is Proportional to Input.—In the stage of proportional physical output, an increase of the variable-input factor by a given percentage leads to an increase of the output by the same percentage. Thus the variable expenses here are directly proportional to output. In the absence of fixed expenses we have a condition of *constant* unit cost; if fixed costs are present, unit cost *falls* to the point of maximum production in the stage. Many factory processes show only the one stage of proportional output. The costs are of two kinds: Those which are fixed irrespective of output, as general overhead; and those which vary in exact proportion to output, such as direct labor costs. If the market will absorb the entire output of such a plant, maximum profit always coincides with maximum production. At maximum output the overhead cost is spread over the greatest possible number of units of product, so that the overhead cost per piece is lowest. Hence least unit cost, maximum net profit, and maximum output all coincide. An illustration typical of this case appears in Table 29. Since marginal cost is

TABLE 29.—COSTS AND PROFITS WITH PROPORTIONAL OUTPUT

Units produced	Marginal output	Cost					Receipts @ \$2	Profit or loss
		Fixed	Variable	Total	Unit	Marginal		
<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>	<i>h</i>	<i>i</i>
100	900	\$500,000	\$ 100	\$ 500,100	\$5,001.00	\$1	\$ 200	-\$499,900
1,000	9,000	500,000	1,000	501,000	501.00	1	2,000	- 499,000
10,000	90,000	500,000	10,000	510,000	51.00	1	20,000	- 490,000
100,000	900,000	500,000	100,000	600,000	6.00	1	200,000	- 400,000
1,000,000		500,000	1,000,000	1,500,000	1.50		2,000,000	+ 500,000

a constant, the marginal analysis is not applicable to a case of proportional output under free competition and the determination of the point of best operation rests upon the analysis in terms of total net profit or loss.

Profit Analysis in the Absence of Competition.—The preceding discussion has been based upon the assumption of free competition and the presence in the market of many competitors. Thus the output of any one competitor will have no effect upon the market price, so we have considered this price to be a constant. This condition of free competition is true of many important segments of modern business and agriculture, but many other industries have undergone so much consolidation and financial interconnection that price competition is no longer typical. Monopoly problems will be reserved for treatment in Chap. XV, but we may point out here that the monopolist is able to influence the prices paid for his output by altering the supply offered for sale. Therefore a constant price cannot be used in the analysis of maximum profits for such a business. Instead a relationship must be found between changes in price and changes in the quantity of goods taken by consumers. This relationship will be discussed in the treatment of monopoly price. Here it is necessary only to indicate that the point of maximum profit for a monopolist may appear *before* his point of least cost. If a low price is required to dispose of a large supply but a small quantity will bring a very high price, the monopolist may operate his plant at a small percentage of its full capacity—and therefore at a smaller output than its least-cost point—in order to maximize his net profits.

IV. OTHER RELATED PROBLEMS

Periodic Productivity.—All industries are subject to variations in the demand for their products. In some lines these changes take place over a period of years, the sales being larger in some years and smaller in others. Again, most enterprises are subject to seasonal fluctuations. Thus department stores sell more goods in December than in any other month of the year. Railroads do a great deal of business in the autumn, when their facilities may be strained to capacity in the movement of agricultural products. The United States Steel Corporation experiences a greater demand in the spring than at other seasons; and in the case of certain industries, such as street railway systems, and electric power and light, telephone, and telegraph services, a large part of the business is done during certain hours of the day. Thus periodic productivity is characteristic of our industrial

system. These changes in demand commonly cause similar changes in the points of operation of the plants concerned when it is impossible to store the commodity or service produced.

Capacity, Load, and Diversity Factors.—The demand for power at a generating station will be greater at one time of the day than at another. The *capacity* of the plant is taken as the total possible sustained output for some period, say 24 hours. Assume it is 50,000 kilowatts. The *capacity factor* is the ratio of the average (mean) output for the given period to the capacity (total possible output). If the 24-hour average output is 20,000 kilowatts, the capacity factor is 40 percent. The *load factor* is the ratio of the average (mean) load to the maximum or peak load of the period (the latter also being an average but taken over a period of only a few minutes). With a peak load of 40,000 kilowatts and an average load, as above, of 20,000 kilowatts, the load factor is 50 percent.

If the normal load is less than output at the most efficient combination, the plant is, on the average, overbuilt. This situation is common in many industries today. Hence interconnection of electrical generating stations improves the capacity factor of any one station through the *diversity factor*, for peak loads on one part of a chain may not occur at the same time as on another part. This condition is noticeable in one district, for example, where a mine and colliery load is going off at the same time that the electric traction load of a near-by city is just rising to its peak in the early evening.

Everything said here is merely a rephrasing of the foregoing discussion. A low capacity factor thus indicates that the plant probably is operating less intensively than in the least-cost combination, and a peak load which approaches the capacity of the plant may mean that operation sometimes is pushed beyond the most profitable combination. It should be noted that capacity as defined above differs from the usage in other fields. Thus some accountants define capacity as the output at least cost; some economists define it as output at the maximum-profit point; and Webster defines it as maximum input.

Additional Cost Terminology.—The costs we have discussed have been called fixed or variable according to whether they were traceable to the fixed-input or variable-input factors. Other terms also are important in treatments of cost and profit prob-

lems. One distinction is that between *prime* and *supplementary costs*. Prime costs, according to accounting procedure, are direct labor and materials expenses alone; supplementary costs include the remainder of business expense. Many economists, however, define prime costs as all *avoidable* costs, so that a plant shutdown would eliminate all prime costs. The supplementary costs then would be non-avoidable; thus they would continue even if plant operation were stopped.

We also may distinguish the *direct* costs from the *indirect* costs of the business. Direct costs are those that can be allocated directly to particular units of product; indirect costs cannot be allocated to individual units, and so often are called *overhead* costs. The overhead or indirect costs, however, are of two kinds. Some indirect expenses continue whether the business produces goods or not. These are the *fixed charges*, such as interest on the investment in machinery and rent on the building and factory site. Other indirect expenses are the result of operation. Examples of indirect *operating* costs are general office expense and light and heat for the plant.

Relation of Overhead to Net Profit.—When the overhead cost of an enterprise represents a large proportion of the total expenses, a relatively small variation in the volume of business leads to a disproportionately large fluctuation in net profits. Some enterprises, of which the railroads are typical, have fixed or overhead expenses which constitute two-thirds or even three-quarters of the total cost of doing business. To illustrate the importance of overhead in such an industry, assume a corporation has a capitalization of \$1,000,000 of which half is in 5 percent bonds and half in common stock. If the company has the following gross income and expenses, the net profit will be \$80,000, which will represent a return of 11 percent on the common stock of \$100 par value:

Gross income.....	\$1,000,000	
Fixed expenses.....	\$600,000	
Variable expenses.....	320,000	
Total cost.....	920,000	
Net profit.....	\$ 80,000	Bond interest: \$25,000
Return per share of stock: 11 %		Earnings per share: \$11

If the volume of business increases 10 percent, the variable expenses may increase by that amount but the overhead would be unchanged if the company had sufficient excess capacity.

With the increased volume, the return per share of common would be 24.6 per cent:

Gross income.....	\$1,100,000	
Fixed expenses.....	\$600,000	
Variable expenses....	<u>352,000</u>	
Total cost.....	<u>952,000</u>	
Net profit.....	\$ 148,000	Bond interest: \$25,000
Return per share of stock: 24.6 %		Earnings per share: \$24.60

On the other hand, if the volume of business decreases 10 per cent, the company will fail to earn bond interest by \$13,000:

Gross income.....	\$900,000	
Fixed expenses.....	\$600,000	
Variable expenses.....	<u>288,000</u>	
Total cost.....	<u>888,000</u>	
Net profit.....	\$ 12,000	Bond interest: \$25,000
Deficit, bond interest not earned: \$13,000		

Selling Expense.—Finally, we have *selling* expense. The cost of selling goods may be due to salesmen's salaries and expenses and to advertising costs. Most economists seem to feel that production costs are the only expenses that need to be considered. Since sales cost frequently accounts for more than half of the final price of many commodities, it must not be overlooked.

Some selling costs partake of the nature of fixed charges and so do not affect the point of maximum profit if the business is characterized by less-than-proportional output. Other selling expenses are directly proportional to output, and so represent a constant cost per unit of product. Finally, there are some selling costs which will vary but not in proportion to output. These expenses affect the point of maximum profit in the same way as do variable-input factor costs. On the other hand, if the business is one in which output varies proportionally with input, selling costs which increase the overhead enhance the pressure to operate at full capacity in order to spread these expenses over as many units as possible. In any case, selling costs must be considered along with production costs, if the correct point of operation for the business is to be determined.

Dumping.—If a plant is suffering from a low capacity factor, its management will attempt to increase production to cut the overhead cost per unit. If more goods cannot be disposed of in

the home market without disorganizing it, overhead cost sometimes may be reduced by selling the goods elsewhere. This process of selling goods on a secondary or foreign market more cheaply than at home is called *dumping*. The minimum price for which the goods can be sold in the secondary market is the direct cost including freight. Any receipts in excess of this amount are "velvet." If overhead costs are covered by the domestic sales, the excess is net profit; otherwise the excess may be used to help carry the overhead.

Heavy overhead costs are characteristic of such enterprises as light and power companies; telephone, telegraph, and cable services; and railroads. The load factors of these industries indicate that the peak load is handled for only a part of the operating period. Thus low rates are paid to consumers who patronize the company's services in slack hours. Night rates for telephone, telegraph, and cable services are lower than day rates. Railroads make use of the practice of dumping when they operate excursion trains at low fares or grant round-trip rate reductions, in order more fully to utilize track and equipment.

Idle overhead may be applied to the human factor as well as to unused plant and equipment. Thus all unemployment represents an idle overhead charge that must be borne by the economic system as a whole in the same way that charges for unused plant capacity are borne by individual industries. Such overhead costs are quite important when the efficiency of the economic system as a whole is considered.¹

Size of Plant.—Many persons speak quite glibly of the size of one plant as compared with another or as contrasted with itself at some other period of time; yet size is an indefinite term. Size of plant may be thought of in at least six ways, as follows: (1) The *fixed-input* factor may be the basis of measurement, as in the case of a railroad whose size is determined by its track mileage. (2) The *variable-input* factor may determine size as, for example, where the number of workmen employed in the plant forms the basis of estimation. (3) *Output* may determine size, as is the case of power plants rated according to the horsepower

¹ CLARK, J. M., "Studies in the Economics of Overhead Costs," University of Chicago Press, 1923; G. P. WATKINS, A Third Factor in the Variation of Productivity, *American Economic Review*, Vol. 5, No. 4, December, 1915, pp. 753-786.

or kilowatts delivered. (4) The *capitalization* or the *money value* of the enterprise may be taken to indicate its size. (5) *Total pay roll* may be used to judge the size of an enterprise. (6) The *earning capacity* of the business may be the basis upon which size is determined.

The efficiency of operation often is said to increase as the size of plant increases, at least until a point is reached where the firm becomes too large and unwieldy. The suggestion thus is that size of plant is a factor in the determination of over-all efficiency in addition to, and quite separate from, the problems of factorial proportion previously examined. This position is unsound, according to the viewpoint in this chapter. All factors may be taken as variable except *management*; in this case the size of plant, no matter how defined, is being adjusted to the manager's ability. Size of plant, therefore, may be considered merely as one aspect of the physical fact of non-proportional output.

On the other hand, two plants producing the same quantity of a given product may utilize factorial proportions which are quite dissimilar. One plant may depend upon a large labor force while the other employs many automatic machines, as is the case with a well-known automobile-frame manufacturer in Milwaukee. His "hand" mill employed 2,000 men but it produced no more frames per day than the "automatic" mill with a scant 200 men. A determination of which is the larger plant will depend entirely on the definition of size that is chosen.

Those industries requiring a large amount of hand labor appear to reach the most efficient size as regards managerial ability, when measured in any way except that of number of employees, much earlier than those composed primarily of automatic machine processes. A central power station, for example, could be very much larger than an establishment producing men's clothing to order, since the manager's ability to coordinate the various factors of production is soonest limited by a large labor force.

The Location of Industry.—Another aspect of the law of non-proportional output, and the search for the most efficient combination, is to be found in the factors which determine the location of industry. This problem has been treated in great detail by Alfred Weber, a German economist. In discussing the influence of transportation costs upon the orientation of production, he says:

Production must find the points of minimum ton-miles . . . How are they to be found? The fact from which we start is that such a location, wherever it may lie, always shows the following transportational relation: The entire weight of the materials which are used in the production must be moved to this location from the material deposits; and the weight of the product must be moved away from this location to the place of consumption. . . . Let us imagine a process of production which uses two localized materials M_1 and M_2 , three-fourths ton of one and one-half ton of the other being necessary in order to produce one ton of the product (which must be transported from the location of production L to the place of consumption C). The locational figure shows the weights three-fourths and one-half moving along the components of the two materials; while the component of consumption carries

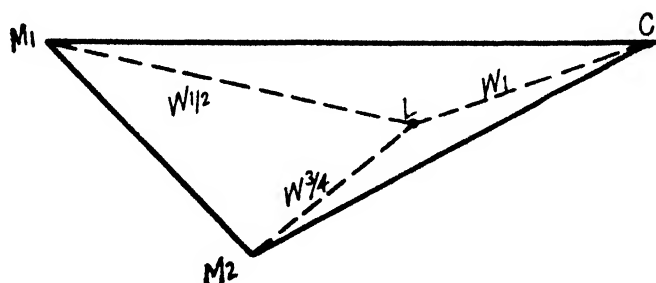


FIG. 19.—Locational diagram.

the weight one. . . . It follows as a general principle that the location will be near the individual corners or far from them according to the relative weight of their locational components.¹

A similar procedure then is applied by Weber to the other factors of importance in determining the location of industry, whereupon the respective costs are introduced so that his analysis presents a means of determining the least-cost location for the plant. If such a location is found, the unit cost of the plant's most efficient combination of the factors of production will be lower than the corresponding unit costs of other plants not so advantageously located. The locational factor, therefore, may be considered as a part of the general problem of non-proportional physical output.

Centralization of Industry.—As a result of early development, natural advantages, superior transportation to and from markets, adequate labor supply, and other factors, American industry

¹ FRIEDRICK, C. J., "Alfred Weber's Theory of the Location of Industries," 1929, pp. 53-55. Reprinted by permission of the University of Chicago Press.

has come to be highly concentrated geographically. When measured in terms of employment, 74 percent of manufacturing wage jobs are found in only 6.7 percent of the 3,000 counties of the nation so that the remaining 93.3 percent of the counties contain only 26 percent of the wage jobs. In 1899, 75 percent of these jobs were located in the New England, Middle Atlantic, and East North Central states. By 1933 some migration to the South Atlantic states had occurred, so that the four regions together accounted for 81 percent of the jobs at the latter date.

Some relocation of industry occurred between 1928 and 1933. Thus the New England states and the East North Central States gained more wage jobs than were lost to other regions during this period, while the Middle Atlantic and West North Central regions lost more wage jobs than were gained. An investigation of the centralization of industry made in 1935,¹ however, reached the conclusion that relatively little decentralization had occurred in recent years except in the South Atlantic states, where industry already was scattered, and in the case of textile and boot and shoe industries, which have a very high ratio of labor cost to value added in manufacture. Thus the suggestion that cheap electric power will attract manufacturing from large cities to the countryside has not yet been borne out in practice and many industries, indeed, may not move to rural areas even if cheap power is available since power costs often are not a determining factor in locational problems.

"Historical Diminishing Returns."—The foregoing analysis of non-proportional output has been based upon the assumption of a timeless, static economic system in which the effects of new inventions and discoveries have been disregarded. Under that assumption we have shown that production cannot be expanded indefinitely without passing into or through the stage of less-than-proportional output. Thus the "law of diminishing returns" is said to be all-pervasive and inescapable. This statement, however, must not be taken to mean that the effects of the law cannot be offset or at least delayed by new inventions. When the static assumption is withdrawn and new inventions and discoveries are introduced into the economy, we find in fact a long history of production in the stage of more-than-proportional out-

¹ CREAMER, D. B., "Is Industry Decentralizing?" University of Pennsylvania Press, 1935.

put (increasing returns). Thus some economists deny the presence of the law of diminishing returns in real life because they do not find it in operation when previous years are compared with the present. They would say there is no such thing as "historical diminishing returns" and might cite data similar to the figures charted in Fig. 20 to prove the point.

The definitely rising trend of physical output per man over a quarter of a century is clear evidence of the fact that inventiveness delays the operation of the law but it is no proof whatever of the claim that the law merely is a figment of the imagination.

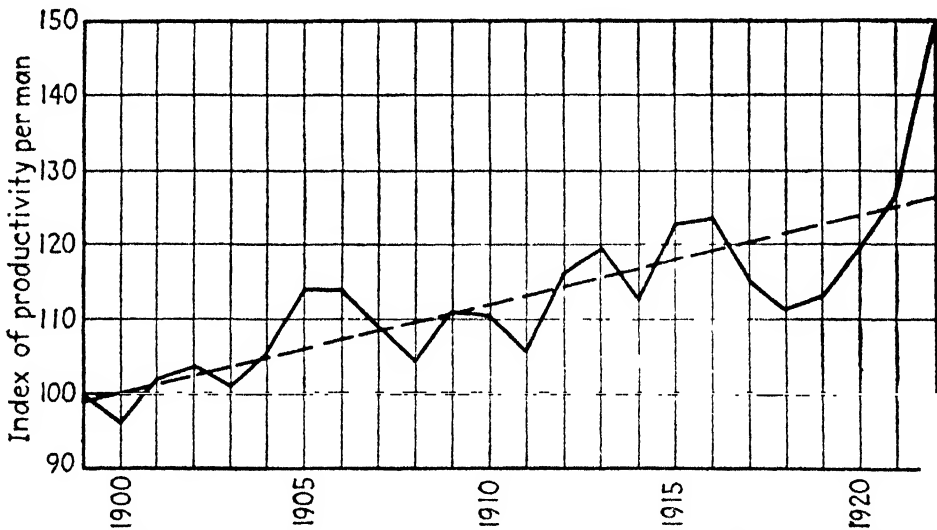


FIG. 20.—National physical productivity per man for the United States, 1899-1922.¹

Controlled experiments in widely separated fields of activity have shown beyond a shadow of a doubt that proportional and, eventually, diminishing returns are inescapable unless discoveries continue to expand the field of man's knowledge. Thus the premium society places upon new inventions may be well justified because it serves to hold back the operation of historical diminishing returns which otherwise would result in a falling productivity per man and so, perhaps, in a declining standard of living as population continues to grow.

The Population Problem and Non-proportional Output.—One of the fundamental problems facing every nation concerns the

¹ Adapted from PAUL DOUGLAS, *American Economic Review Supplement*, March, 1928. (Index of Physical Productivity, p. 149, divided by Index of Employees, p. 148; straight-line trend fitted.)

relation of its population to its natural resources. Under given industrial methods there is an *optimum population* of a nation, or of the world, for the available resources. The natural resources, in this instance, comprise the fixed factor, the number of people being considered as variable. The desirable combination of these factors is the one yielding the greatest output *per person*, *i.e.*, the variable optimum combination. If the number of inhabitants of a country is less than this amount, additions to the population will increase the average output per person. A population greater than the variable optimum, on the other hand, will result in a reduced per capita output. The reduced per capita output will impair living standards and will react unfavorably on the general welfare of the nation.

This relation between numbers and resources gives rise to many important problems. What, for example, is the situation in the United States? Do we have an optimum population today? If not, by how far do we miss the mark, and in which direction? If new inventions and improved production methods are introduced at a sufficiently rapid rate, can population continue to increase without passing the optimum?

Although the significance of these questions is evident, they cannot be answered with a high degree of precision. Detailed information bearing on these points either is not available or else is open to more than one interpretation. The importance of the population problem is in no way mitigated by this situation, however, for it is an all-pervading fact of economic life.

Problems

87. The following table shows the relation of fuel mixture to the power developed by a Willys Knight motor at a constant speed of 1,000 revolutions per minute under half load.¹

- a. Locate the fixed and variable optimum combinations.
- b. Can you locate the most efficient combination if cost data are unknown? Why?
- c. If the fixed factor costs 10 cents per unit and the variable factor costs \$1.43 per unit, locate the least-cost combination. Under what conditions might operation occur at some point other than the least-cost combination? Explain.

¹ The Carburetion of Gasoline, Purdue University, Engineering Experiment Station, *Bulletin* 5, 1920, p. 6.

Combina- tion	Input (needle valve adjustment)		Output (b. hp.)		Average output (b. hp. per lb. of gasoline)
	Lb. dry air (fixed)	Lb. gasoline (variable)	Total	Proportional	
<i>A</i>	100	4	4.0	.....	1.000
<i>B</i>	100	5	6.6	5.00	1.320
<i>C</i>	100	6	10.6	7.92	1.767
<i>D</i>	100	7	12.2	12.37	1.743
<i>E</i>	100	8	12.5	13.94	1.563
<i>F</i>	100	9	12.4	14.06	1.378
<i>G</i>	100	10	12.2	13.78	1.220
<i>H</i>	100	11	11.8	13.42	1.073
<i>I</i>	100	12	11.0	12.87	0.917

88. In 1935 the Ender Manufacturing Company had total sales receipts of \$1,000,000. Its fixed expenses were \$550,000; its variable expenses were \$400,000. In 1936 total sales receipts increased 10 percent and profits 120 percent over 1935, though fixed expenses remained unchanged. In 1937 total sales receipts fell 10 percent below the 1935 level and the company sustained a loss.

a. Show the amount of sales, fixed and variable expense, total expense, and profits or losses for 1935, 1936, and 1937, in tabular form.

b. On the basis of the tabulated data account for the changes in profits.

c. Is this company an example of proportional, less-than-proportional, or constant output? Why?

89. An advertising brochure gives the following data on the performance of a six-cylinder "caterpillar" Diesel engine:

Fuel, lb.	B. hp.	R.p.m. (approx.)
32	65.5	440
36	77.5	512
40	90.0	578
44	100.2	655
48	108.8	708
52	116.5	777
56	122.3	827
60	127.1	866
64	130.9	905
68	134.2	937
72	136.4	960
76	136.7	963

a. Compute average and per-unit marginal brake horsepower for each quantity of fuel consumed. Name the stages of output shown.

b. At what point does marginal b. hp. intersect average b. hp.? Explain why the intersection *must* occur at this point only.

c. What conclusions can you draw from this table regarding the best speed of operation for this motor? What additional information is necessary for a complete answer to this question?

90. a. Explain the meaning of the term "stage of less-than-proportional output."

b. Is it possible for the effects of the law of non-proportional output to be offset (overcome) in some way? Explain.

c. State, without the use of figures, the relationship between (1) the point of least cost and the stage of less-than-proportional output; (2) the point of greatest profit and the point of least cost.

91. The following table shows the relation of throttle opening to the power developed by a Model-T Ford motor at a constant speed.¹

Com- bination	Inputs		Output		Average output (B. hp. per lb. of gasoline)
	Motor (fixed)	Lb. gaso- line (variable)	B. hp.	% of capacity	
A	1	3	1.785	21.8	0.595
B	1	4	2.856	34.9	0.714
C	1	5	4.760	58.2	0.952
D	1	6	6.120	74.8	1.020
E	1	7	7.000	85.6	1.000
F	1	8	7.696	94.1	0.962
G	1	9	8.181	100.0	0.909

a. Locate the stage of less-than-proportional output. Why is this stage important?

b. How many stages of output are shown? How many would it be possible to find theoretically in an experiment of this particular type?

c. Under what conditions would least cost appear in combination D? Combination G? Why?

d. When might it be profitable to operate in combination B? Why?

92. You are appointed manager of a small company making automobile heaters. Your supplies of machines, tools, and factory space are definitely fixed, but you have the option of employing as many workers as you wish. Explain in terms of the law of non-proportional output how you would

¹ Ford motor (Model T) at constant speed of 600 revolutions per minute with varying loads; adapted from Test of a Ford Motor, thesis for the degree of Bachelor of Engineering, No. 163, by R. R. Brown, V. H. Colon-Morales, G. E. Edmunds, O. F. Rehn, Ohio State University, 1917.

determine the number of men that would yield the largest profit. Figures are not necessary.

93. "The larger the business the lower the cost per unit of output." Is this true without limit? Or only within limits? Or not at all? Why?

94. Would a higher birth rate and increased immigration be conducive to a greater per capita output in the United States or should the nation prohibit immigration and encourage contraception practices in order to advance the general welfare? Have European or South American countries reached the optimum population? Discuss.

References

- ALFORD, L. P.: "Laws of Management," Ronald Press Company, 1928.
- BLACK, J. D.: "Introduction to Production Economics," 2d ed., Henry Holt & Company, 1930.
- CLARK, J. M.: "Studies in the Economics of Overhead Costs," University of Chicago Press, 1926.
- FRIEDRICK, C. J.: "Alfred Weber's Theory of the Location of Industry," University of Chicago Press, 1929.
- GRANT, E. L.: "Principles of Engineering Economy," Ronald Press Company, 1930.
- HASTINGS, H. B.: "Costs and Profits," Houghton Mifflin Company, 1923.
- HAYES, H. G.: "Our Economic System," Vol. 1, Henry Holt & Company, 1928.
- KIMBALL, D. S.: "Industrial Economics," McGraw-Hill Book Company, Inc., 1929.
- LEHOCZKY, P. N.: "Quantitative Management," Hedrick, 1935.
- TAUSSIG, F. W.: "Principles of Economics," 3d rev. ed., Vol. I, The Macmillan Company, 1924.
- TAYLOR, F. M.: "Principles of Economics," 9th ed., Ronald Press Company, 1925.
- TAYLOR, F. W.: "The Principles of Scientific Management," Harper & Brothers, 1911.
- YOUNGER, JOHN: "Work Routing in Production," Ronald Press Company, 1920.

CHAPTER XIV

COMPETITIVE PRICES

Consumers, middlemen, and producers continually are engaged in a daily round of buying activities in order to satisfy their requirements for food, clothing, entertainment, raw materials, laborers' services, and numerous other items. Similarly a majority of these same individuals act the part of sellers in order to dispose of their goods or services in exchange for an income which will permit them to buy consumption goods. Buying and selling give rise to the exchange process, in which goods are exchanged for goods in the final analysis but for money in the immediate sense. Since our economic society is largely pecuniary, almost everything has its price—its monetary equivalent—if it is of economic significance. Prices are the common denominator of the economic- or exchange-value of things, and exchanges between buyers and sellers are effected on the basis of prices asked, offered, and received. It may be very difficult to ascertain exactly how prices are determined in every individual case but some general principles may be formulated upon the basis of observation and deductive reasoning.

Buying at the Grocery.—Since everyone is familiar with retail transactions, we may introduce the subject of prices by a brief examination of the exchange process in the corner grocery. Much of the food consumed in households is selected personally, although some of it is purchased by description over the telephone. Housewives may prefer to examine meats, fresh fruits, and vegetables to determine the quality; they may visit the grocery hoping that attractive displays will yield an inspiration for the next meal; or they may wish to compare prices in several stores on standardized merchandise or branded articles. Thus the buyer judges whether the price is high or low with reference not only to the cost per unit but also to the quality of the unit, for the height of the price clearly depends upon both variables.

Most grocers plainly mark the prices of the goods on their shelves for the convenience of their customers, to assure all cus-

tomers that they are paying the same prices, and to make certain that the correct prices are charged. If the housewife thinks the price is too high on her favorite brand of breakfast food she may not purchase it, or if she discovers that there is a sale on this brand she may buy more of it because of the unusually low price. If she is not familiar with the brands displayed, she may select the one at the highest price because she expects it to be of the highest quality, or she may take the cheapest brand because she thinks it will be just as good; she may select a brand because she has seen it advertised; or she may ask the grocer for his advice on which brand to buy.

Consumer Choices and Prices.—Probably it does not occur to the housewife that her buying activities have any bearing upon the prices of groceries. She feels that their prices are fixed entirely by the grocer. They determine only what she shall buy and how much; but when she refuses to buy an article she registers indifference or outright disapproval and so limits its sale, at least in that store. When she makes a purchase her act expresses approval of the article at the price asked and so its sale is stimulated. These points apply as well to the purchase of thousands of dollars' worth of materials by a large corporation as they do to the buying of household supplies at the corner store.

How the Grocer Marks His Prices.—When the grocer marks prices on his goods he attempts to name prices that will be popular with the public and will invite purchases, yet that will permit him at the same time to cover his costs and to make a satisfactory profit. Usually he cannot be successful in both these aims simultaneously. High prices will yield larger profits per unit but competition from neighboring stores will reduce his patronage, while low prices will increase his volume of trade but may eliminate net profits altogether. Thus the experienced seller realizes that he is at the mercy of the public in disposing of his merchandise, and that he is not a price dictator even though he might like to be one. The grocer cannot always estimate exactly what the public wants. Some articles will sell more quickly than had been anticipated, while others will sell more slowly. If sales are good the price may be raised somewhat, while if they are slow the price must be reduced eventually in order to dispose of the goods. The seller hopes to enjoy profits from his merchandising, when profits and losses are averaged out over a year's time, but he

knows that he may be more or less successful than he had planned to be.

Prices.—Certain conclusions may be drawn from this brief description of merchandising practice. Thus the *function* of commodity prices is to regulate the production and consumption of the articles to which they apply. The world is not so rich that every demand can be satisfied; thus supply and demand forces are brought into equilibrium by means of the machinery of prices. When a commodity bears a certain price, this price not only selects those individuals whose purchasing power and whose desire for the commodity are great enough to induce them to pay the price, but also determines the quantity that will be forthcoming in view of the production costs that prevail. At the same time that the commodity goes to the favored purchasers, all others are excluded from securing it by the height of the price, so that demand thus is reduced to a point corresponding to the relative scarcity of the article. Therefore the reason for a price always is the scarcity of supply as contrasted with demand.

Here is a motorcar selling for \$875, hosiery for 99 cents a pair, coats at \$98.50, a suite of furniture for \$169.75, a radio set for \$69.98, and so on. Why are these prices as they are? Why does the radio set not sell for 99 cents or for \$875? Why should it be offered at \$69.98 instead of \$70? This and the two following chapters on prices will present answers to these questions. The present chapter will discuss price determination in terms of the interactions of the forces of supply and demand under competitive conditions. The next chapter will consider the setting of retail prices, as well as quasi monopoly and monopoly prices. The third will deal with those prices that are fixed directly or indirectly by governmental authority.

Supply.—The term *supply* means the number of units of an article that will be offered for sale at a given price, while the phrase *supply schedule* refers to the list of the number of units that would be offered at each of a series of possible prices. Supply does not refer necessarily to the total number of units produced at the given price, since part of the output may be stored in expectation of a higher price at a future date. In general, however, the total number of units produced in a given period will be offered for sale in that period.

What is the relation between price changes and the number of units offered for sale? If the price of a given grade of bituminous coal at the mine increased from \$2.50 to \$7 per ton, unquestionably the production of coal would be greatly augmented. This addition to supply would be composed of two parts. First, the mines already in operation would become more active, more miners would be placed on the pay roll, and a greater daily output would result. Second, some mines that had been closed down because of the former unprofitable state of the market would resume operations and, if there was reason to believe that the higher price would continue for some time, new mines might be opened, thus further swelling the supply offered for sale at the higher price.

Conversely, if the price of bituminous coal at the mine fell from \$2.50 to 25 cents per ton, the production of coal would be curtailed. This restriction would appear, on the one hand, as a slowing down of the rate of extraction in some mines through the laying off of miners and the curtailment of the hours of work per week and, on the other, as the complete closing down of those mines that would not be operated at all under such conditions. Therefore, the higher the price the greater the supply offered for sale, and the lower the price the smaller the supply offered for sale. This situation may be presented abstractly by means of a supply schedule composed of assumed data, as shown in Table 30.

TABLE 30.—ASSUMED SUPPLY SCHEDULE OF BITUMINOUS COAL

Supply, millions of tons	Price
450	\$7.00
400	5.50
350	4.00
275	2.50
175	1.00
50	0.25

This information may be shown in the “smoothed” supply curve shown in Fig. 21. The smoothing process is permissible only on the assumption that the series is *continuous* rather than *discrete*, *i.e.*, that there would be an infinite number of small variations in supply with corresponding small variations in price. Most actual price series are discrete, yet these curves will be useful in clarifying an understanding of supply and demand conditions

just as long as care is taken to remember that infinitely small variations do not really occur. Furthermore, the supply curve is based on the assumption that competition is so perfect that all the price-supply relationships fall on the supply curve. Finally, the typical supply curve presents information relative to a given moment of time. It shows the amounts that *would be* supplied *now* if the prices were as shown, and not the quantities that will be offered *during* the next week, month, or year.

Demand.—*Demand* refers to the number of units of an article that will be purchased at a given price and therefore includes not only the desire for a commodity but also the ability and

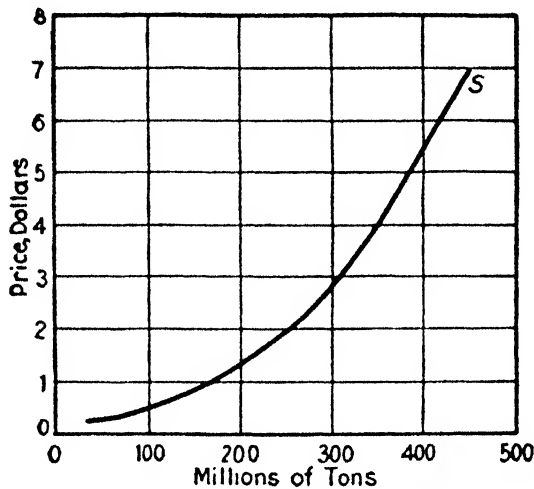


FIG. 21.—Assumed supply curve for bituminous coal.

willingness of the buyer actually to purchase it at some price. Thus demand is influenced, among other things, by the price of the article and by the amount of purchasing power available in the hands of its possible buyers.

The behavior of demand is the reverse of supply in so far as price changes are concerned. If the price of bituminous coal rises from \$2.50 to \$7 per ton, there will be a considerable reduction, ordinarily, in the number of tons desired. Some bituminous-coal buyers will use substitutes such as anthracite coal, natural or artificial gas, and oil. Others, who cannot make use of substitutes, will be much more economical in their use of coal. Hence the number of persons in the market for coal will be reduced by a sharp rise in its price, and the number of tons desired by those remaining in the market will be curtailed.

If the price of coal should fall from \$2.50 to 25 cents a ton, the number of units demanded would undoubtedly increase. Bituminous coal would be substituted for more expensive fuels by persons who entered the market at the lower price, and the amounts purchased by those already in the market would increase. This situation may be illustrated by the demand schedule, given in Table 31.

TABLE 31.—ASSUMED DEMAND SCHEDULE FOR BITUMINOUS COAL
Demand,

millions of tons	Price
225	\$7.00
275	5.50
350	4.00
400	2.50
450	1.00
525	0.25

The demand situation also may be presented as a smoothed curve, Fig. 22, which refers to the assumed demand for coal and

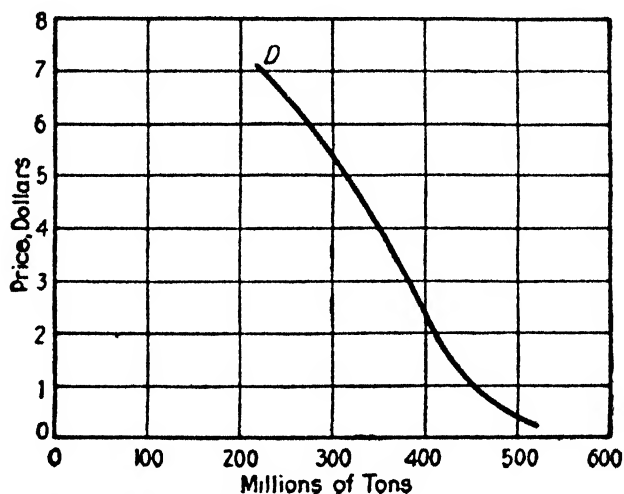


FIG. 22.—Assumed demand curve for bituminous coal.

is to be interpreted in a manner similar to that set forth above in the discussion of supply.

In the discussion of the law of diminishing utility in Chap. XII, a bar chart was used. If that bar chart were converted into a smoothed curve of utility, it would show a close resemblance to the demand curve given above. This is because the demand curve is a composite of a series of personal demand schedules which are based directly on diminishing utility. Hence we should

expect the curves of utility and of demand to evidence this similarity in regard to direction of slope.

Typical Demand Curves.—Four typical demand curves for agricultural products are shown in Fig. 23. Since these curves

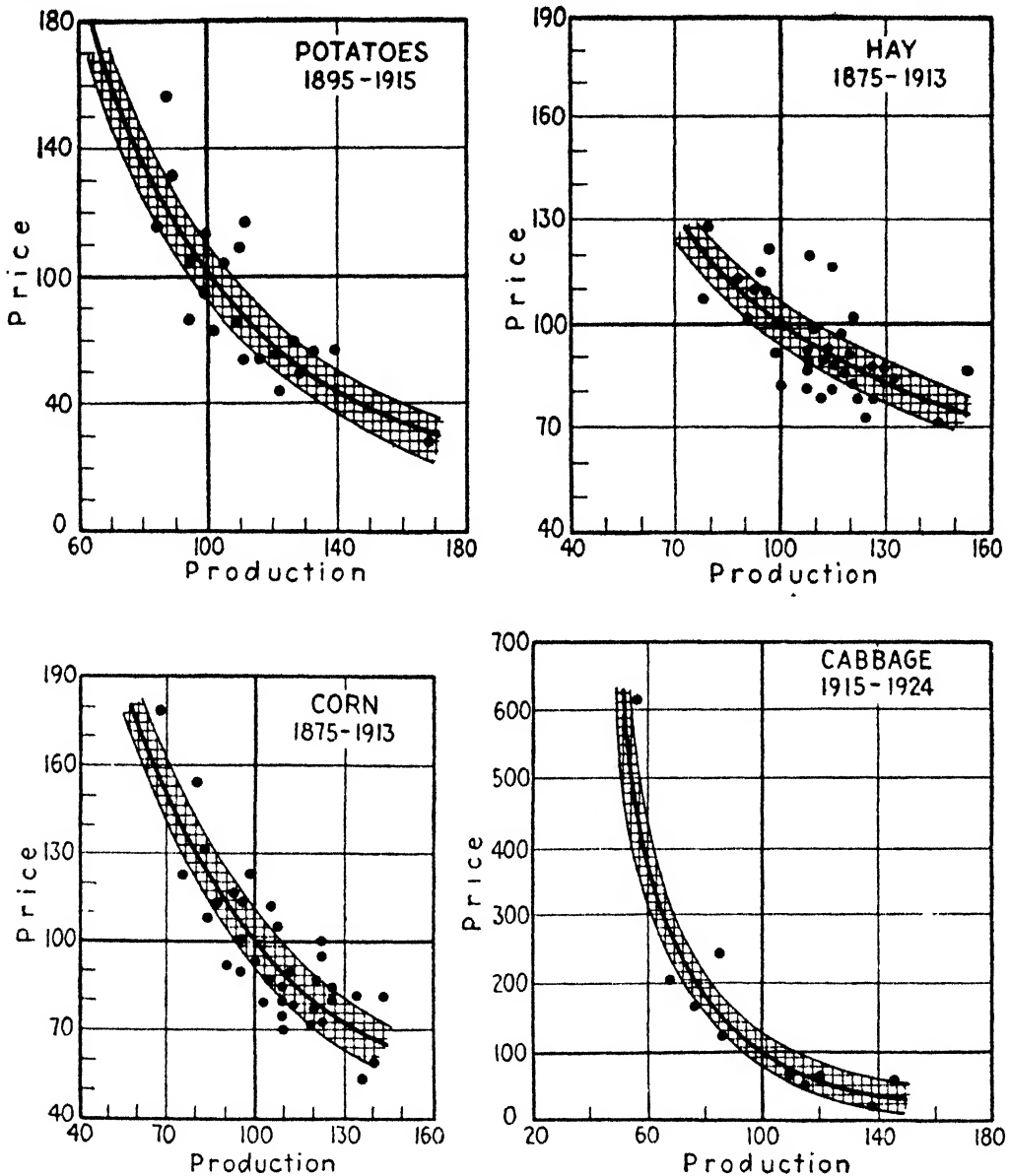


FIG. 23.—Demand curves for specified agricultural products in the United States.¹

represent lines of best statistical fit to a group of points, the demand areas are drawn so that the probability is 1 out of 2 that

¹ Adapted from WARREN, G. F., and F. A. PEARSON, *Interrelations of Supply and Price*, Cornell University Agricultural Experiment Station, *Bulletin* 466, 1928, pp. 7, 26, 34, and 36.

any demand-price relationship for the period covered will fall within the area. Supply areas, of course, may be drawn in the same manner.

Supply and Demand in Market-price Determination.—When the two schedules explained above are combined a *supply and demand schedule* is obtained by means of which the price that will

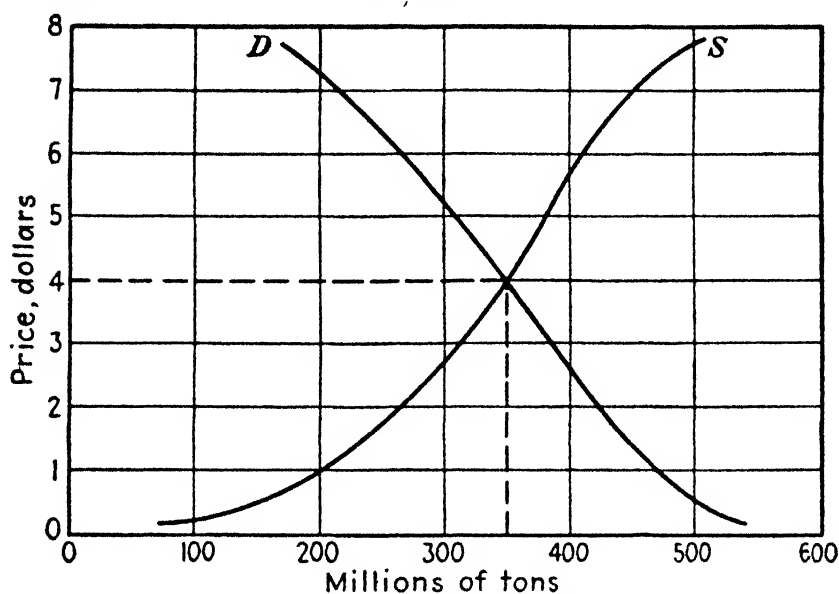


FIG. 24.—Assumed supply and demand curves for bituminous coal.

be established for bituminous coal under the conditions set forth in the two schedules can be determined (see Table 32 and Fig. 24).

TABLE 32.—ASSUMED SUPPLY AND DEMAND SCHEDULE
OF BITUMINOUS COAL
(Millions of Tons)

Supply	Price	Demand
450	\$7.00	225
400	5.50	275
350	4.00	350
275	2.50	400
175	1.00	450
50	0.25	525

Under the conditions as assumed, the price of bituminous coal at the mine would be \$4 per ton. It could not be more, because the number of units offered for sale at such a price, say \$5.50, would so far exceed the number demanded that some of the sellers

would offer coal at a lower price in order to dispose of their holdings. The lower price, \$4, would exclude part of the supply from the market; at the same time, it would induce additional buyers to enter the market and thus would permit the entire supply offered at \$4 to be sold.

The price could not be less than \$4 a ton, on the other hand, because so many persons would be competing against each other in order to buy the small number of units offered that the price would be bid up to \$4. At the same time, supply would be increased so that all those demanding coal at this price would be able to secure it. Hence, under a condition of free competition, price will be set at the point where supply and demand are equal *i.e.*, at \$4 and at no other point.

Altered Supply Conditions.—The above discussion presupposes no changes in production technique or in costs of production. If such variations do occur, a change in the entire supply schedule will be required. A similar result will be found if the costs of operation are reduced whether by cheaper labor, materials, and power; by the discovery of better methods of operation; or by the invention of new processes and machinery. A reduction in cost of operation will lead to a greater output at each of the given prices. Hence the entire supply schedule must be changed, and a new price will be established, as in Table 33. If costs had risen, on

TABLE 33.—ALTERED SUPPLY CONDITIONS, COSTS REDUCED
(Millions of Tons of Bituminous Coal)

Altered supply	Price	Demand as before
525	\$7.00	225
500	5.50	275
450	4.00	350
400	2.50	400
350	1.00	450
275	0.25	525

the other hand, the amount produced and offered for sale at a given price would have decreased. Price would have risen in this event, rather than have fallen as it did before.

The behavior of supply and demand in Table 33 requires us to distinguish carefully between two possible meanings of the phrase

“a change in” supply or demand. Has supply increased? Has demand increased? To answer these questions intelligently, we must recall the difference between a schedule and the items within the schedule. Thus the supply schedule has changed: Supply has increased, if we mean by that statement the fact that *all* items in the supply schedule are larger than they were before *at the same prices*. According to this meaning, there has been no change in the demand schedule at all. The amounts that would be taken at given prices are the same as they were before the change in supply. However, the amount of demand actually in the market obtaining the satisfaction of wants is greater than before. Therefore we may say demand has changed, *but in terms of a totally different meaning of the phrase*. A different part of the original demand schedule is effective now because of the change in price. The independent variable was the change in the whole *supply schedule* and the dependent variable was the change in the *effective demand*. One of the most common errors of the average man in economic discussions is that of confusing these two simple meanings of “change.” The student should watch very carefully his use of this term.

Altered Demand Conditions.—Demand conditions are also subject to change from time to time. The consumer’s demand for a commodity may be enhanced through an increase of his purchasing power or changes in the prices of substitute articles, or because of the discovery of new uses for the product, or because of fashion changes, or through modifications of his standard of living. Such alterations in consumer demand will require the substitution of an entirely new demand schedule. Table 34 shows the effects of such an increase in demand; the effective supply

TABLE 34.—ALTERED DEMAND CONDITIONS, DEMAND INCREASED
(Millions of Tons of Bituminous Coal)

Supply as before	Price	Altered demand
450	\$7.00	300
400	5.50	400
350	4.00	450
275	2.50	500
175	1.00	525
50	0.25	550

has been increased as a result of the changed demand schedule. Demand may be reduced, on the other hand, through changes opposite to those just mentioned. This alteration would require the substitution of still another demand schedule, and the determination of another price, to represent the altered situation.

The Elasticity of Demand.—The degree to which the number of units demanded varies with changes in price in any given demand schedule is highly important. This elasticity of demand may be *unitary*, *more than unitary*, or *less than unitary*. In order to determine which classification fits a particular case it is necessary only to divide the total receipts (demand \times price) at a *given price* by the total receipts at the *next higher price*. If the quotient is 1.0, the elasticity of demand is unitary; if any decimal less than 1.0, elasticity is less than unitary; if any quantity more than 1.0, elasticity is more than unitary. Thus in the first demand schedule presented (Table 31), the elasticity of demand is less than unitary throughout, as shown in Table 35.

TABLE 35.—ELASTICITY OF PURCHASE
(Millions of Tons)

Price	Demand	Receipts	Elasticity
\$7.00	225	\$1,575.00	$\left. \begin{array}{l} \$1,512.50 \\ \$1,575.00 = 0.96 \\ \$1,400.00 \\ \$1,512.50 = 0.93 \\ \$1,000.00 \\ \$1,400.00 = 0.71 \\ \$450.00 \\ \$1,000.00 = 0.45 \\ \$131.25 \\ \$450.00 = 0.29 \end{array} \right\} \text{All less than unitary}$
5.50	275	1,512.50	
4.00	350	1,400.00	
2.50	400	1,000.00	
1.00	450	450.00	
0.25	525	131.25	

The extreme limits of variation are zero elasticity if a given quantity will be taken at *any* price, and 100 percent elasticity if a whole series of quantities will be taken at a *given* price.

Factors Affecting Elasticity.—Several factors may affect the elasticity of demand for a particular article. One of the most

important is the law of diminishing utility (see Chap. XII), which says that the consumption of successive units of an article results in the diminution of the utility of each additional unit. The consumer is thus led sooner or later to forsake this commodity and to turn to some other one in order to satisfy his remaining wants. A second important factor in elasticity is the possibility of substitution. If the price of wheat is too high, it is relatively easy for the consumer to change to the use of corn, rye, or barley. Thus the elasticity of demand for wheat is more than unitary at high prices. This relation of elasticity to price is due to the close connection between elasticity of demand and limitation of purchasing power. If an article costs so little that the amount spent for it during a week, or a month, does not appreciably affect an individual's budget, an increase in its price might lead to but little curtailment in the amount purchased, if there is no ready substitute.

A third important factor lies in the customary or habitual nature of certain prices. Thus the habit of paying a particular price for a particular article tends to make its elasticity of demand more than unitary above the usual price. Customers may regard an increase in a long-established price as being so unreasonable that many of them will refuse to purchase the commodity at any higher price. Finally, the nature of the article is an important determinant of elasticity. Thus if an article is a "luxury" its demand will be more elastic than if it is a "necessity," since consumers cannot very well forego the use of the latter type of commodity.

Relation of Elasticity of Demand to the Farm Problem.—Elasticity of demand is of the greatest importance in the case of agricultural products. The effect of an abnormally large crop of cotton on 1926 cotton prices is illustrative. This crop, 17,977,000 bales, was about 25 percent larger than the 3-year mean for 1925–1927, yet the price had to fall $33\frac{1}{3}$ percent, from 18 to 12 cents a pound, in order to dispose of the large crop. Again a large crop of potatoes usually yields less money to farmers than does a small crop. Thus during the 6 years from 1923 to 1928 the value of the potato crop varied inversely with the amount produced (Table 36). This fact indicates that the elasticity of demand for potatoes is decidedly less than unitary.

TABLE 36.—PRODUCTION AND VALUE OF THE POTATO CROP, 1923-1928*

Year	Price per bushel	Production, bushels	Value
1925	\$1.87	323,465,000	\$604,072,000
1926	1.41	354,328,000	501,017,000
1927	0.97	402,741,000	388,741,000
1923	0.78	416,105,000	324,889,000
1924	0.62	421,585,000	263,312,000
1928	0.53	462,943,000	250,043,000

* *Agricultural Yearbook*, 1930, p. 765.

Relation of the State of the Market to Demand.—The discussion of demand indicated that, in general, a rise in price leads to a reduction in the number of units demanded, while a fall in price would increase the number of units demanded. There is one important exception to this situation. If a rise in the price of a given article is taken to mean that the price will advance still further, buying will be stimulated for a time. The demand schedule would thus be altered temporarily in the direction of an increase in the quantities taken at various prices. Similarly, if a fall in price is taken to mean that the price will drop still further, customary purchases will be postponed as much as possible, and the demand schedule will have been reduced temporarily.

In all such cases, however, the fall in price will not check buying, nor will a rise in price increase buying, except within somewhat narrow limits. These limits are set by the normal range of price fluctuations for the commodities concerned. Thus if the prices of some commodities begin to fall, this will check buying; but as prices continue to fall, the customary buyers finally will come to believe that prices cannot fall much further, and buying then will be stimulated.

Marginal and Superior Producers.—The analysis of factorial proportion in Chap. XIII led to the conclusion that a competitive producer obtained his greatest profit at an output greater than that in his least-cost combination, if he secured any profit at all. Competitive producers are faced with a market which will absorb the entire output of any one manufacturer at a constant price. Therefore the elasticity of purchase for such a producer is 100 percent. The market price may change from time to time as a

result of the activities of all the producers together, but the actions of any one manufacturer will not affect price directly.

The chief distinction between producers in such a competitive market is the fact that no two of them are likely to have exactly the same costs of production. The efficiencies of different managers vary to a wide extent. With a given market price, therefore, some producers will receive profits while others may just break even or may suffer a loss. The *superior producer* is the one who will secure a net profit; the *marginal producer* barely will succeed in balancing receipts against costs. Thus the unit

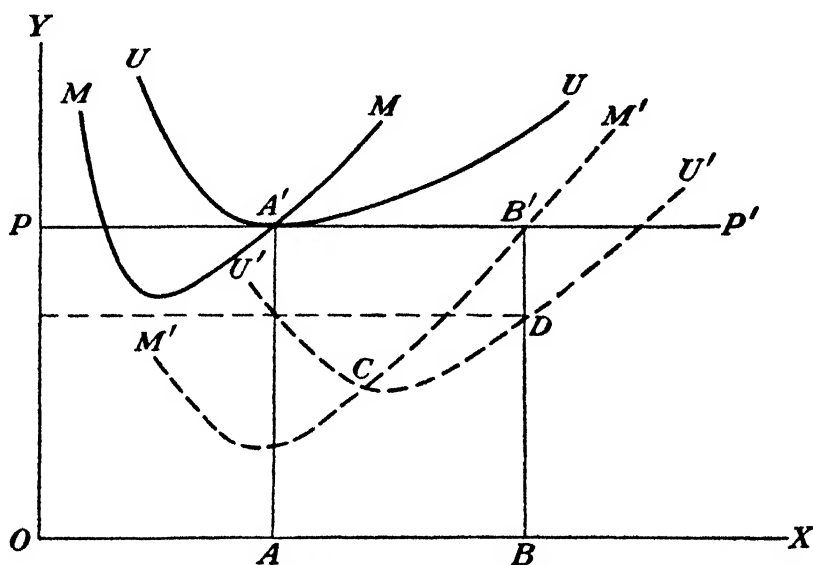


FIG. 25.—Cost curves for marginal and superior producers in competitive business.

cost of the marginal producer will be equal to the sales price, while the unit cost of the superior producer will fall below price, at the point of least cost. The marginal cost for each producer will be equal to sales price at some point; for the marginal producer this equality appears where marginal cost intersects unit cost at least cost, while for the superior producer marginal cost will meet sales price at an output larger than that at least cost. Both producers, therefore, will find one and only one cost in common: Their marginal costs will be equal at their respective points of best operation.

These cost relationships are shown diagrammatically in Fig. 25. Output is measured along the OX axis, and price and costs along the OY axis. The height of the sales price is represented by the distance, OP , or AA' , or BB' . The unit cost UU of the

marginal producer intersects the price line PP' at A' , the point of least cost. His marginal cost curve MM also intersects UU and PP' at A' ; the marginal manager should produce the quantity OA since his point of best operation is determined by the intersection of MM and PP' at A' . At this point he secures no net profit since UU also passes through A' , but he therefore avoids the incurrence of a loss.

The marginal cost curve $M'M'$ of the superior producer passes through his unit cost curve $U'U'$ at C , his point of least cost, but it does not intersect the price line PP' until B' , his point of maximum profit. Therefore the superior manufacturer should produce the quantity OB . Thus these two producers have different scales of operation (OA and OB), and different average costs (AA' and BD) at their points of best operation. One secures no profit while the other obtains a net profit ($PB' \times B'D$). Both producers, however, have identical marginal costs ($AA' = BB'$). Hence the marginal costs of all manufacturers in a competitive market are equal, while their average costs and their net profits may be unequal.

An example of the differences in productivity in a number of plants in the same industry is given in Table 37. The six tire

TABLE 37.—NUMBER OF TIRES PRODUCED PER MAN-HOUR FOR SELECTED YEARS IN THE PLANTS OF SIX COMPANIES MANUFACTURING AUTOMOBILE TIRES*

Year	Company					
	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>	<i>F</i>
1925	1.39	1.27	0.82	0.69	0.67	0.53
1927	1.68	1.22	1.17	0.72	0.85	0.56
1929	2.31	1.42	1.21	0.84	0.94	0.40
1931	2.44	1.86	1.45	1.34	1.07	0.60

* Bureau of Labor Statistics, *Bulletin* 580, July, 1933, pp. 13-14.

companies range from *A* to *F* in order of declining productivity of tires per man-hour. All the companies showed increased productivity per man-hour in 1931 as compared with 1925 but *A* had a gain of 76 percent whereas *F* gained only 13 percent in the 6 years. Thus in 1931 the labor cost per tire in *F* was four times as great as in *A*, so that the latter was in a preferred position

in that regard in the search for net profits, assuming, of course, that wages per man-hour were the same in both companies, which may not have been the case.

Price Relationships.—All prices are mutually related to each other. The price of no one good or service can be determined, broadly speaking, without reference to the prices of other goods and services. As a distinguished English economist, Alfred Marshall, has said, each price is dependent upon every other price somewhat as the position of each marble in a round-bottomed bowl is dependent upon the position of every other marble. Prices are not adjusted to each other so delicately as this analogy implies them to be, of course, yet a considerable degree of inter-relationship does exist in our present-day price system.

One of the most important relationships is that between price and cost. The lower limit of price for most commodities rests upon the costs that must be incurred if the given supply is to continue to be forthcoming. Competitive price, on the other hand, is not likely to remain far above the costs incurred by the least efficient producers whose output is required to equate supply to demand. There are a few commodities whose price is not related to cost at all, it is true, for they have no cost of production or reproduction in the strict sense, but these exceptions do not invalidate the truth of the general statement that price is related to cost.

Another significant relationship is based upon the fact that costs are prices. That is to say, the raw-material cost that an electrical equipment manufacturer has to meet in the form of payments for copper, for example, is a selling price for the copper miner. The costs of machinery and supplies that the miner has to meet are, in turn, prices at which the machinery and supplies were sold by their producers. Proceeding in the opposite direction, prices are costs. The price of the motor turned out by the electrical manufacturer first cited becomes a cost to the person who buys the motor and therefore helps to determine the selling price of his products, and so on. Hence the interdependence of prices is very close, and any one price is more or less intimately tied up to most other prices through the cost-price-cost chain of relationships.

Joint-cost Products.—In the production of certain articles, the supply of one follows as a natural consequence of the production

of the other. Usually in cases of *joint production* the articles of minor importance are described as by-products. The by-product coke oven furnishes an excellent example. Neither coke, gas, nor by-products can well be produced alone. Up to a certain point in the process they must be considered as one article, but after this stage is reached the various products are separated into independent economic goods.

The determination of the price of each of two or more articles that are produced jointly is an interesting problem. First, the prices of the joint products taken together tend to equal the combined cost of their production. Second, there is, however, no relation between the price of one article produced at joint expense and its cost of production except in so far as it undergoes further processing after the separation of the products. On some of the by-products price may barely equal the separate expense involved, while in the case of others price may be much above the separate expense. This depends on the supply and demand factors for each of the joint products independently, but it is, of course, necessary that the combined prices of joint-cost products cover their total cost.

Market Price vs. Normal Price.—The foregoing discussion of price determination has been phrased in terms of *market price*, of free competition, and of less-than-proportional output. The *market price* of a commodity is the price which will exist in the "short run," when changes in demand are such that permanent alterations in production capacity are not necessary to provide the equilibrium between supply and demand. It has been shown that market price must cover the marginal costs of all producers. In other words, market price must cover the variable costs of production but it need not cover the overhead costs in the short run. When a fixed investment is once made it often may not be recovered in the form of cash, if the business is liquidated, without suffering a considerable depreciation in value. Thus it may pay to conduct business at a price which will yield something over the variable expenses so that at least a part of the overhead may be met as an alternative to closing the business down entirely with the consequent loss of much of the fixed investment.

In the long run, on the other hand, *all* expenses must be covered if the business is to continue in operation. Thus the price must cover average costs as well as marginal costs. *Normal price*

is the term used to describe this condition, and market price then may be said to fluctuate around normal price but not to remain below it for a long period unless the normal price equilibrium is repeatedly disturbed by the entrance of new competitors whose production keeps price somewhat below the average costs of some of the producers. We may assume in general, then, that normal price must equal or exceed total cost of production. Now suppose we have a permanent change in the demand schedule—an increase in demand due to the growth of population, let us say—which will necessitate an expansion of production capacity. When the new equilibrium between supply and demand has been

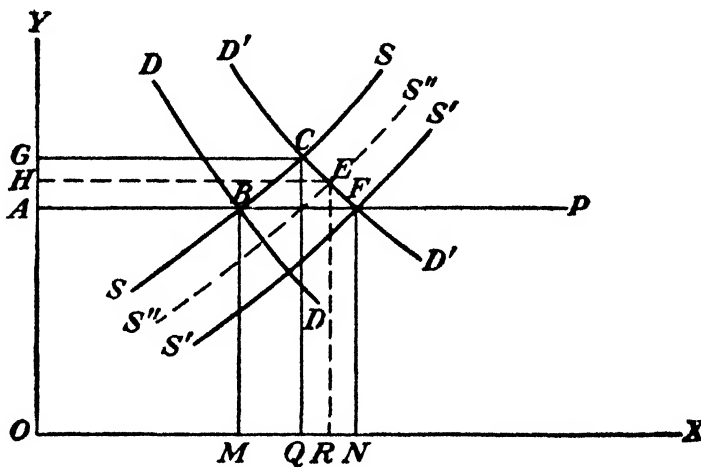


FIG. 26.—Normal price with constant cost.

established, what will be the relation of the new normal price to the old one? The answer will depend upon the behavior of costs of production as capacity is expanded. The three possibilities in this connection now will be examined.

Normal Price with Constant Costs.—There is a small class of industries whose output may be expanded within rather wide limits without any material change in average costs of production. An example of such a *constant-cost* industry might be the production of hand-made cigars. If it became necessary to increase output 100 percent, additional floor space, raw materials, and employees would produce the larger quantity at the same average cost as before. Figure 26 will serve to illustrate this situation. The former normal price was $MB = OA$ dollars and the quantity produced was OM units, as shown by the intersection of the demand curve DD with the short-run supply curve SS . If the demand changes now to $D'D'$, the first effect is a rise in market

price to $CQ = OG$ dollars and an expansion of output from existing plants to OQ units. The additional profit secured at the higher price leads to an expansion of production capacity. As the new supply comes on the market, $S''S''$, and then $S'S'$, the market price declines to $ER = OH$ and then to $FN = OA$ dollars. A further expansion of supply would be unprofitable, since the average cost of production is OA dollars by assumption that cost of production is a constant. Therefore the new normal price FN equals the old normal price BM , and the market price, which rose to CQ dollars, has declined to the old level again at FN . The output, however, has been expanded from OM units to ON

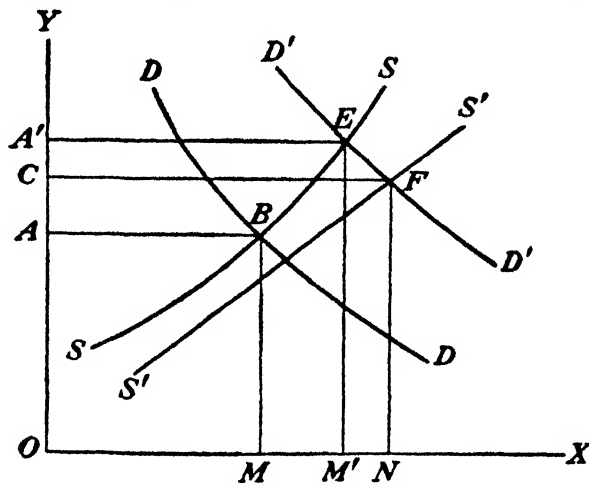


FIG. 27.—Normal price with increasing costs.

units by way of the steps OQ and OR . It should be noted that the constant-cost situation cannot continue indefinitely, since a sufficient expansion of capacity would so increase the demand for labor, materials, and working capital as to raise the prices charged for these factors of production. When these prices rise, average cost will rise unless large-scale operations lead to greater efficiency, but the latter contingency also is limited by size.

Normal Price with Increasing Costs.—The extractive industries, such as farming, mining, forestry, and fisheries, frequently are classified as subject to *increasing costs* of production as output is expanded. Thus larger crops may require the use of poorer soils and it may be necessary to use poorer or deeper veins if more coal is to be produced. Therefore average costs tend to rise as production is increased. The normal price situation typical of such enterprises is shown in Fig. 27. The former normal price was $MB = OA$ dollars and the quantity produced

was OM units, as shown by the intersection of the demand curve DD with the supply curve SS . If the demand changes now to $D'D'$, the first effect again is a rise in market price to $EM' = OA'$ dollars and an expansion of output from existing farms to OM' units. The additional profit secured at the higher price leads to an expansion of production capacity. As the new supply $S'S'$ comes on the market, the market price declines from OA' to $FN = OC$ dollars and the output is further expanded to ON units. At this point a new equilibrium is established, but it is above the old normal price by the amount AC owing to the increase in average cost of production occasioned by the expansion in production

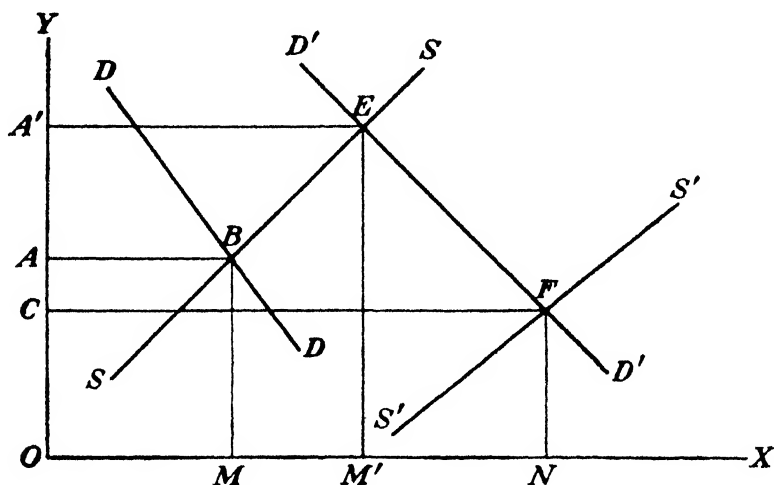


FIG. 28.—Normal price with decreasing costs due to external economies.

capacity at increasing cost necessary to provide the additional supply $M'N$.

Normal Price with Decreasing Costs.—Many industries, particularly in the field of manufacturing, show a reduction in average costs as output is increased. These *decreasing costs* may be the result of two causes. On the one hand, the increasing size of the plants in an industry may lead to certain *external economies* which reduce the cost of production for *all* plants alike. In the automobile field, for example, an automobile-frame manufacturer may be able to produce frames more cheaply than many of the car manufacturers themselves because he specializes in this work. Thus the car builders find their costs reduced because the scale of operation in the industry permits economies due to specialization outside the plant of any one car manufacturer. External economies, then, come from specialization of tasks and functions

which are *not* under the control of any one plant manager but which redound to the benefit of all the competing plants. Figure 28 will illustrate this condition. The former normal price was $MB = OA$ dollars and the quantity produced was OM units, as shown by the intersection of the demand curve DD with the supply curve SS . If the demand changes now to $D'D'$, the first effect may be a rise in market price to $EM' = OA'$ dollars, and an expansion of output from existing plants to OM' units. If the additional production permits the external economies just mentioned to be obtained by specialization, the cost of production is reduced and the new supply curve $S'S'$ establishes a price of $FN = OC$ dollars. Thus the market price declines and the new normal price is below the old normal price because of the decreasing costs for all plants, which lower the average costs to a point below that at which they were found before the external economies were available.

The second cause of decreasing costs is found in certain *internal economies* which may appear within a given plant as it expands production. One source of these economies is found in plants which were overbuilt, so that the large excess capacity permits a reduction of average cost as overhead expenses are spread over more units when output is increased. Another source of internal economies appears when the capacity of the plant is expanded in such a way that the larger plant is more efficient than the smaller one. Assembly lines and other quantity-production methods provide examples. Under these conditions a plant's average cost will fall until the factory reaches its least-cost size. The changing relation of price to cost under these conditions is shown in Fig. 29. When the plant was first built, let us assume, it had a capacity of OX units and an average cost curve YZ in the vertical plane $OXZY$. If the market price was OA dollars, OM units would be produced at a net profit of $ABCD$ dollars. If the plant expands its capacity to EJ units, an addition of IJ , its cost of production will be lowered because of internal economies so that the average cost curve becomes HQK . In order to sell the additional supply the price is reduced through competitive price cutting from OA to EG dollars. At this price EN units are produced at a net profit of $FQLG$ dollars. Thus the price reduction forces competitors out of the market, lowers average cost of production, permits the plant to sell more units, and produces a

larger net profit. As long as costs within the plant continue to decline with additional output, the price-cutting incentive is all-powerful and the market will be characterized by cutthroat competition. This price reduction will stop, and a new normal price will be established, only (1) when decreasing costs change to increasing costs within the plant, or (2) when no competitors are left in the market, the price line GR no longer is horizontal, and the market is characterized by monopoly instead of competition.

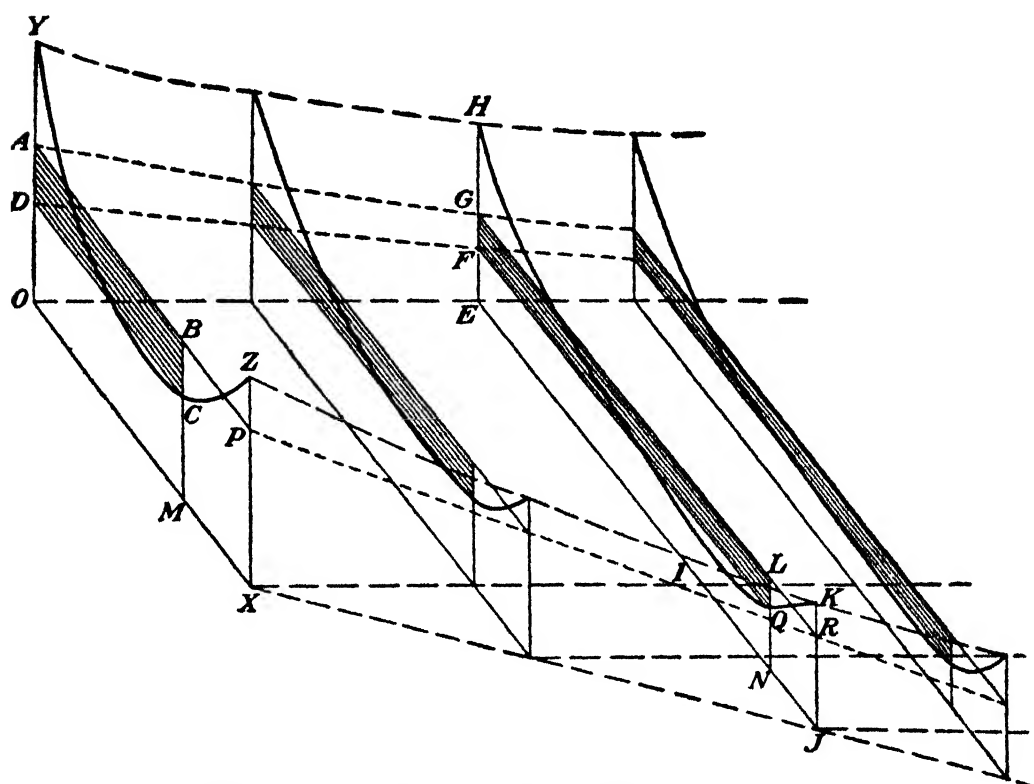


FIG. 29.—Market price with decreasing costs due to internal economies.

Therefore decreasing costs within the plant (internal economies) are incompatible with free competition. Thus this cost condition must lead to the increasing- or constant-cost cases discussed above, or else to monopoly, a case which will be examined in the next chapter. A normal price with decreasing costs, therefore, must mean that the costs fall because of external economies, or else that internal economies have led to the establishment of a monopoly.

Normal Price with Proportional Output.—When output increases in exact proportion to the variable factors utilized, the average cost of production declines until full capacity is reached

and the marginal cost is a constant. In a plant of a given size, therefore, the point of best operation, and thus the market-price output, will depend upon the relation between the rate at which the average cost declines and the elasticity of demand. This situation is illustrated in Fig. 30, where DD represents the curve of demand and CC the curve of average cost. Although the maximum capacity of ON units has the lowest unit cost, namely ON dollars, the maximum-profit area $AEFB$ is obtained at an output of OM units which can be sold for OA dollars each. If the demand curve were more nearly horizontal the number of units to be produced would approach full capacity, while a steeper demand curve would have the opposite effect.

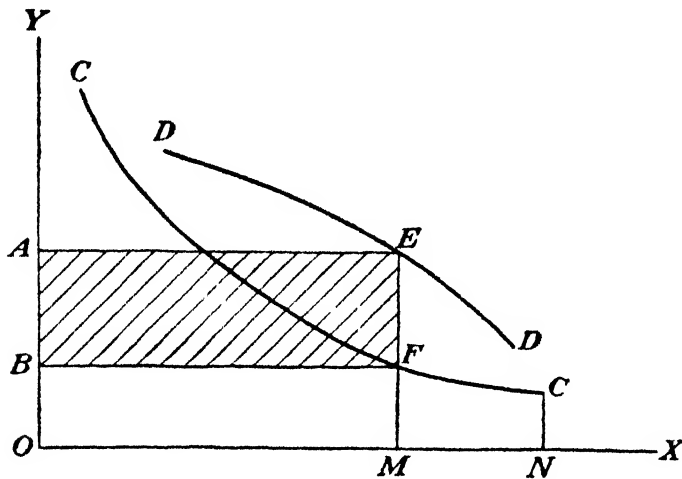


FIG. 30.—Market price with proportional output.

If demand now increases, the question of plant expansion may arise. The height above the base line OX of the new average-cost curve will depend upon whether the expansion of the size of the plant leads to increasing, constant, or decreasing costs. These possibilities are shown in Fig. 31. Before expansion, full capacity was OL units, and average cost declined from OY dollars to LD dollars as the plant was more fully utilized. When the size is increased, the capacity becomes OM units. The additional investment raises average cost from LD to LE dollars, after which fuller utilization lowers it to FM dollars, the least-cost size utilization. If further expansion occurs, average cost will be higher because of the inefficiencies which frequently accompany excessive size. Thus the answer to the question whether a plant subject to proportional output should expand will depend upon

moderately free play of competitive forces. The prices of such products, therefore, may be thought of as determined directly by the forces of supply and demand. In other words, even a slight fall in price normally will curtail the supply offered and increase the units demanded, while a slight rise in price will increase supply and curtail demand.

In the case of raw-material markets, the organized exchanges are of major importance. The grain, cotton, rubber, sugar, and farm-produce exchanges permit the free play of competitive forces to a high degree. The same situation is true of the stock and bond exchanges. Here the conditions are most conducive to the smooth operation of free competition. These are undoubtedly the best examples of markets in which prices are set directly by the interaction of supply and demand factors.

Violent competition, it may be said in conclusion, is like an intermittent geyser. Ordinarily, it is not in action continuously but it may break out at almost any moment, under a variety of circumstances, to exert its influence upon prices. It may involve only a penny on a can of beans between two unit stores, or it may be a bitter war between giant corporations striving for international markets; but whatever its form, competition arises over the fight for consumer patronage. If the competition is in the nature of price cutting, it usually means reduced profits for at least some of the producers involved. Consequently, those adversely affected by it are ever ready to avoid competition. That is to say, they will attempt to control prices in various ways. This phase of the subject will be considered in Chap. XV.

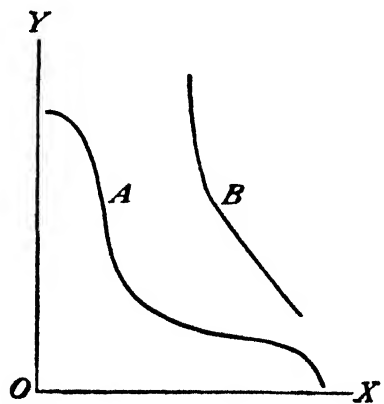
Problems

95. Does the competitive pricing process limit the demand to the available supply or does it adjust the supply to the existing demand? Explain and illustrate.

96. The accompanying figure shows two assumed demand curves, *A* and *B*. Which of these do you think best represents the facts of demand in real life? Defend your answer.

Do they show more or less than unitary elasticity? What curve would show zero elasticity?

97. In Fig. 25, could output be determined if curves *MM* and *M'M'* alone were given with line *PP'*? Why? Could net profit or loss be determined



under the above condition? Why? With all the curves as given in Fig. 25, change the price line to the height *BD*; what quantities will each manufacturer produce, and how much profit or loss will be obtained? Why?

98. "Normally 1 ton of coal cooked in a by-product oven will yield, in by-products, 12 gallons of tar, 27 pounds of ammonium sulphate for fertilizer, 11,000 cubic feet of gas, 3 gallons of benzol, ammonia, and other products in addition to the coke." What effect would an increased demand for coke have upon its price? Upon the price of gas produced from the same coal? Upon other by-products? Explain. Substitute beef for coke and hides for gas. Does the same analysis apply? Explain.

99. "Suppose we pick out a new automobile and put it on a table in a glass case and seal it up airtight, so that whenever it is taken out it will be just as good as it is now. Paint on the side of the case the price of the car. To make calculation easy, let us set it at \$2,000. Let us come back a year from now and look at that car. It does not look quite so good as it did a year ago, and we think that the price of \$2,000 is just a little high—even those enthusiastic salesmen do not think they can sell it at \$2,000. 'What do you think it is worth?' They say, '\$1,800' and we put that on the outside of the case. The next year we come back and the \$1,800 is too high, so we write \$1,600 and the next year we write something lower still. At the end of 10 years nobody but the junkman will set a price on it, even though it is as perfect a car as it was the day we put it there. Did the car change? No. That car certainly did not depreciate, because that was the premise of the experiment. What has happened? The eyes on the outside looking through have changed. Values do not exist in material; they exist in the minds of the people who are going to buy." Charles F. Kettering in an address at Ohio State University in 1936.

Precisely why would people devalue the automobile in this illustration? Would the same reasoning apply to the value of a corner lot in a rapidly growing city? To an original Rembrandt? On the basis of your answer formulate a statement on how people evaluate things.

100. "Price determines supply and demand; supply and demand determine price. This is circular reasoning. Therefore the whole supply and demand analysis is false." Do you agree? Why?

101. Assume a nation-wide increase in the demand for meat; what will tend to be the effect on the price of meat? Of shoes? Of bone meal?

References

Note. See references at end of Chap. XVI.

CHAPTER XV

IMPERFECT COMPETITION AND MONOPOLY PRICE

Most retail prices and some wholesale prices, as was suggested in Chap. XIV, are not determined directly by the free play of the forces of supply and demand. Competitive conditions in these markets are different from those found on the organized exchanges. Methods are available by means of which merchants may gain some knowledge of the prices their competitors are charging. Nevertheless, competition based upon such information is at best but partially free in these markets. The absence of free competition is even more noticeable on the part of consumers. Lack of knowledge, time, ability, and purchasing power are all factors leading toward a restraint of the free competition exercised by sellers and buyers in this field.

I. IMPERFECT COMPETITION

The Bargaining Range.—If competition is not so free, if the forces of supply and demand do not function so continuously in the determination of prices in this field as compared with the organized exchanges, more than one price actually may be found in a given market at a given time for similar units of some commodity. This situation may be illustrated by a supply and demand schedule as shown in Table 38. Under these conditions

TABLE 38.—ASSUMED SUPPLY AND DEMAND SCHEDULE
(Bargaining Range)

Supply	Price	Demand
550	\$10	450
550	9	475
500	8	500
500	7	500
450	6	525
450	5	550

price could be *either* \$7 or \$8, if we follow the line of reasoning that was presented in Chap. XIV. Thus a single price is not definitely established here, and a *bargaining range* exists.

Supply and Demand Areas for Imperfect Competition.—When imperfect competition permits the existence of a bargaining range, we may represent the situation by supply and demand areas similar to those for demand shown in Fig. 23 in Chap. XIV. Since competition is imperfect, all the sellers in a market may not be charging the same price and the buyers may not be offering the same price. Thus the supply and demand data cannot be plotted on smoothed curves but may be represented by areas

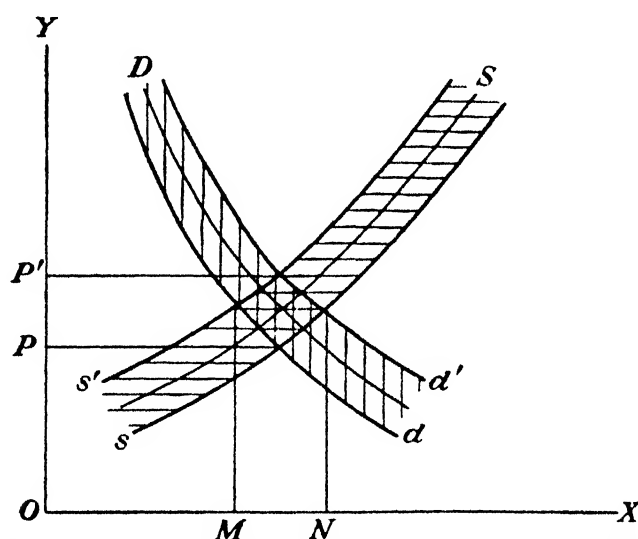


FIG. 32.—Supply and demand areas for imperfect competition.

drawn so that the probability is 1 out of 2 that a given supply-price relationship, or demand-price relationship, will appear within the area. An example of this method appears in Fig. 32.

The band dd' is drawn about the demand curve D so as to include one-half the demand-price relationships, and the band ss' is drawn about the supply curve S in the same manner. The intersection of the two areas shows that the most probable price falls between OP and OP' and the most probable quantity exchanged falls between OM and ON . The bands will be wide or narrow, and the range of probable prices and quantities large or small, chiefly in terms of the extent to which competition is imperfect. Supply and demand forces still set limits to the prices that may be charged but, since these limits now permit the quotation of more than one price, other factors determine why prices

are just as they are. Retail and wholesale prices under these conditions may be determined by one or more of several practical methods, some of the more important of which will now be considered.¹

Average Markup.—In pricing merchandise, retail stores often add a normal or average markup, in the form of a percentage usually reckoned on the basis of selling figures, to the cost of the goods. Markups consist of three items: (1) the *estimated expense* of operation involved in marketing the goods, (2) the *net profit* that the seller deems it necessary to secure, and (3) any *anticipated markdowns*. The average percentage of markup may be based on the operations of the entire store or business or on those of a specific department or line of goods handled. Prices set in this manner necessarily are tentative and are open to revision as conditions warrant. This method is particularly suited to the sale of staple merchandise that is subject to few and infrequent price fluctuations.

Competitive Business Leaders.—Prices often are determined to a large extent on the basis of competitive leaders. A single firm will sometimes take the initiative, and others will follow, selling at, above, or below the competitor's price, depending upon the policy in operation. The smaller firms, whether retailers, wholesalers, or manufacturers, usually follow such a leader closely in adopting a price that will enable them to compete successfully. In the manufacturing field, a few leaders are the Standard Oil Company, the American Sugar Refining Company, and the United States Steel Corporation, whose prices are closely watched and commonly followed by their less powerful competitors. One or more firms in practically every retail and wholesale market are recognized as leaders in the trade. Their prices are used as a basis for the determination of the amounts to be charged for competing goods.

Price Understandings.—Price understandings among competitors are not uncommon, particularly in the marketing of

¹ Economists often have failed to give adequate attention to this phase of the pricing problem, so that its analysis has been undertaken largely by students of marketing. The reader is referred to H. H. Maynard, W. C. Weidler, and T. N. Beckman, "Principles of Marketing," rev. ed., Ronald Press Company, 1938, for a more detailed discussion of the method of treatment here presented.

unbranded staple products such as coal and lumber. These loose agreements may be brought about through trade associations or merely as a result of customers' shopping activities, for unless all sell the same product at similar prices, the sales volume of the vendor quoting higher prices will suffer, provided he has no compensating services to offer.

Wage policies sometimes play an important role in this connection. A manufacturer may agree to pay higher wages if the labor union promises to protect him by requiring his competitors to pay similar rates. Thus the possibility of competition through price cutting due to lower wage payments is eliminated.

Stable Prices.—In the shoe trade a number of manufacturers and retailers have adopted the stable-price policy, all shoes in a given store or of a given kind being marked, say, at \$5 or \$6. There are also \$5 millinery stores, and numerous vendors sell men's hats and clothing at stable prices. All such attempts apparently aim to imitate the policies of 5- and 10-cent stores and other variety stores whose price limits are fixed at 25 cents, 50 cents, and \$1.

Customary Prices.—When a price has prevailed for some time, it is taken for granted by buyer and seller alike. Coca-cola, various brands of chewing gum, chocolate bars, and numerous other articles have been sold at the same prices for a considerable period of time regardless of business cycles, changes in the general average of prices, and tremendous fluctuations in the prices of the raw materials, labor, and capital which enter into their production. Once prices have been established as customary, it may be extremely hazardous to undertake upward changes. If wholesale prices should rise sufficiently to threaten the retailer's margin, the latter might insist on a reduction in quality or might discontinue the line entirely, rather than attempt to raise a customary price to a new level. In packaged goods the same result may be obtained by reducing the quantity per package.

Convenient Prices.—Prices may be convenient from the standpoint of payment and change making. This policy would lead to the quotation of prices in even rather than odd amounts. New York City subways present a case in point. By using nickels as "keys" to operate turnstiles, the company, in effect, enrolls the government as one of its sources of equipment. Dimes serve a similar function on the motorbus lines in Chicago.

Another application of convenient prices may be illustrated by the sale of apples to the consumer. Formerly the general practice was to sell them by the measure, but there is a tendency now to sell them by the pound, the price being usually in the neighborhood of 25 cents for so many pounds. The 25-cent figure then becomes the constant, but the number of pounds sold for this sum varies with changes in the wholesale price of the product.

Odd Prices.—In contrast to the use of convenient prices, odd prices have become prominent in recent years. Some stores use odd figures on all merchandise carried, while others limit their use to certain departments, lines of goods, or individual articles of a line. Odd prices present the idea of a bargain, as if the price had been reduced to the last possible cent, although this impression sometimes is given by raising prices, instead of lowering them. It is said that more articles can be sold at 17 than at 14 cents, because the former price suggests a reduction from 20 cents, while a price of 14 cents merely suggests a reduction from 15 cents. This situation is possible, of course, only because of the lack of knowledge and competition on the part of buyers.

Lowest Prices.—Some manufacturers and merchants have adopted a policy of underselling all competitors in the market. This practice sometimes takes the form of a guaranty that prices are as low as, or lower than, the amount for which the same articles can be purchased elsewhere. So-called cut-rate establishments may be following such a policy, or they may be attempting to give that impression when actually using an odd-price policy, as explained above.

Leaders.—Most stores make use of "leaders" from time to time in the attempt to attract customers. Leaders are commonly well-known, nationally advertised brands marked to sell at prices below the customary or advertised level. There are two main types: profit leaders and loss leaders. In the case of profit leaders, the articles are offered at less than the customary price but are not sold at a loss by the vendor. He either restricts his profit margin somewhat or else purchases the goods at a low price especially for such an occasion. Loss leaders, however, are sold at such a price that the vendor actually suffers a slight loss, but he anticipates compensation through the profits he

expects to realize from the sale of other goods to the shoppers who have been attracted by the leader.

Cash vs. Credit Prices.—Merchants vary in their price policies in regard to the cash or credit status of their customers. Some vendors quote one price for cash and another, higher, price for credit customers. This policy is well exemplified by the large mail-order houses. Perhaps a majority of retail merchants, on the other hand, make no price distinction between cash and credit sales, thus placing part of the credit purchaser's rightful burden on the buyer for cash.

Retail, Wholesale, and Producers' Prices Compared.—The methods of determining retail prices, some of which have been outlined above, are quite significant. They are often retroactive in nature and thus establish the upper limits to prices at all preceding points in the chain of distribution. The prices quoted by wholesalers to the retail trade, therefore, will depend largely upon the prices at which the latter group of merchants proposes to resell the goods to consumers. The manufacturer, in turn, in selling to the wholesaler must make his quotation such that the latter may resell to his trade at a profit. There is thus a tendency for the price-cost relationship to run in an opposite direction here from that described in Chap. XIV. There costs set a lower limit to price; here price sets an upper limit to costs. That is to say, a large number of commodities are produced to sell at a certain price. If that price must be lowered for any reason, then cost of production, or quality, or both also must be reduced.

The Significance of Certain Wholesale Prices.—In the case of articles whose prices are subject to a considerable degree of immediate control by supply and demand forces, the wholesale market plays a leading role in price determination. This situation is true of most agricultural commodities. Operators in the wholesale markets are the first recipients of market information relating to conditions of supply and demand. Thus the wholesale price becomes the controlling price for both producers' and retailers' markets. Producers' prices, *i.e.*, the prices paid at the farm or factory, generally follow wholesale prices more closely than do retail prices in these cases.

Charging What the Traffic Will Bear.—Prices frequently are set on the basis of what it is thought purchasers would be willing to pay. Through his past experience and thorough knowledge of

his clientele, it is not difficult for a retailer, wholesaler, or manufacturer to determine the price range at which certain articles can best be sold. This method is applied primarily to style goods; men's clothing and women's ready-to-wear in particular fall in this category.

As a matter of fact, this principle is of much more universal application than is often recognized. Every seller endeavors to charge all that the traffic will bear. Elasticity of purchase, however, is always a factor which sooner or later limits the amount that the traffic will bear. Moreover, competitive industries are subjected to the additional limit imposed by the activities of competitors. Businessmen attempt to charge all that the traffic will bear, and as a result they attempt to estimate the prices that will permit them such a rate, limited, of course, by the factors mentioned above. Monopolies, however, are not subject to so much limitation from competition.

II. MONOPOLY PRICE

Monopoly implies unified or single control of some distinctive commodity. Upon the basis of this definition, monopolies may be separated into two groups: (1) quasi monopolies, and (2) true monopolies. *Quasi monopolies* are very common today. The owner of a special process, patent, trade name, or trade-mark is able to control the supply of products that are thus distinguishable from the general mass of commodities. He therefore possesses to some extent the characteristics of a monopolist, except that his degree of control is less complete than that of the true monopolist, owing to the possibility that consumers may substitute other but similar products. Such an individual is therefore called a quasi monopolist.

A *true monopoly*, however, would entail control of the supply of some unique commodity for which no satisfactory substitute is available. Hence true monopolies are seldom encountered unless the monopoly is a legal one, *i.e.*, established and protected by law, as is the case of the tobacco monopoly in France, for example. The true monopoly represents a case at the opposite extreme from free competition. When the two extremes have been examined, the middle ground of real life may more readily be understood.

Monopoly Price: Unitary Elasticity.—Like every other producer, the monopolist seeks the point of greatest net profit. Unlike other producers, however, he is in a better position to influence the price at which he will sell his output since he can determine the quantity that shall be offered on the market. Because the supply is subject to control, the sales price may be influenced and so we cannot assume 100 percent elasticity of demand for his product.

Let us suppose, first, that the elasticity of demand is unitary. In this situation the total receipts will be a constant by definition. Therefore the monopolist would seek to restrict output to that point at which his total cost is a minimum. Theoretically, he should produce one unit and no more, since his variable expenses would thus be least and the sum of his fixed and variable expenses would be the smallest possible amount. Actually, no real demand schedule could maintain unitary elasticity for a wide range of prices. When the price becomes quite high, demand is sure to fall off more and more rapidly owing to the limited purchasing power available in the hands of most customers. When the price becomes quite low and a very large quantity of goods is taken, a saturation point will be reached where no additional units are desired because of the effect of the law of diminishing utility. Therefore we may expect the monopolist to restrict output only to a point where unitary elasticity changes to more than unitary elasticity as price rises.

Monopoly Price: More than Unitary Elasticity.—When the monopolist is faced with more than unitary elasticity, he will

TABLE 39.—MONOPOLY PRICE WITH MORE THAN UNITARY ELASTICITY:
"DECREASING COST"

Price	Demand	Receipts	Addi- tional receipts	Total cost	Addi- tional cost	Net profit	Unit cost
\$1.00	190,000	\$190,000		\$170,000		\$20,000	0.895¢
0.90	275,000	247,500	\$57,500	185,000	\$15,000	62,500	0.673
0.80	350,000	280,000	32,500	200,000	15,000	80,000	0.571
0.70	425,000	297,500	17,500	215,000	15,000	82,500	0.506
0.60	500,000	300,000	2,500	230,000	15,000	70,000	0.460
0.50	600,000	300,000	0	245,000	15,000	55,000	0.408
0.40	700,000	280,000	-20,000	260,000	15,000	20,000	0.371

select a point of operation such that any higher price curtails total receipts at a rate greater than the shrinkage in total cost and any lower price expands total cost faster than the growth of total receipts. Such a point, therefore, will yield the greatest net profit to be obtained from that market. Assumed data which illustrate this situation appear in Table 39. The balance between additional receipts and additional cost appears at a price of over 70 cents, while the least-cost point appears at some price less than 40 cents. Note that elasticity is more than unitary from \$1 to 60 cents; is unitary from 60 cents to 50 cents; and becomes less than unitary below 50 cents. It is this behavior of elasticity that is responsible for the operation of this plant before the least-cost point. In other words, the plant is too large for the market it is designed to serve. A growth in the market due to greater prosperity or to a larger population would permit operation at a point nearer to full capacity and therefore closer to least cost. An attempt on the part of the monopolist to expand the market through price reductions is doomed to be unsatisfactory, however, because the market expands too slowly to cover the additional costs involved.

The costs in this monopolist's plant might have evidenced a somewhat different behavior. The point of least unit cost might have appeared at the point of greatest net profit, or it might have been found before that point. The latter possibility is illustrated in Table 40. With the same demand schedule but

TABLE 40.—MONOPOLY PRICE WITH MORE THAN UNITARY ELASTICITY:
"INCREASING COST"

Price	Demand	Receipts	Addi- tional receipts	Total cost	Addi- tional cost	Net profit	Unit cost
\$1.00	190,000	\$190,000		\$ 80,000		\$110,000	\$0.421
0.90	275,000	247,500	\$57,500	90,000	\$ 10,000	157,500	0.327
0.80	350,000	280,000	32,500	120,000	30,000	160,000	0.343
0.70	425,000	297,500	17,500	180,000	60,000	117,500	0.424
0.60	500,000	300,000	2,500	290,000	110,000	10,000	0.540
0.50	600,000	300,000	0	460,000	170,000	-160,000	0.767
0.40	700,000	280,000	-20,000	700,000	240,000	-420,000	1.000

with a more rapidly rising cost, the point of maximum profit appears at a price somewhat above 80 cents, whereas the least-

cost price is about 90 cents. Thus the statement made in Chap. XIII to the effect that no competitive business will secure its greatest net profit at an output smaller than that in its least-cost point cannot be carried over to the case of the monopolist. If we see a plant obtain a net profit and yet operate at a smaller output than that produced in its least-cost point, we may be *certain* that free competition is not effective in that industry. Restriction of output to preserve a market is typical of many fields in manufacturing, but we do not hear of farmers thus curtailing production individually without assurance that other farmers will act in the same way. This assurance is not necessary to restriction in

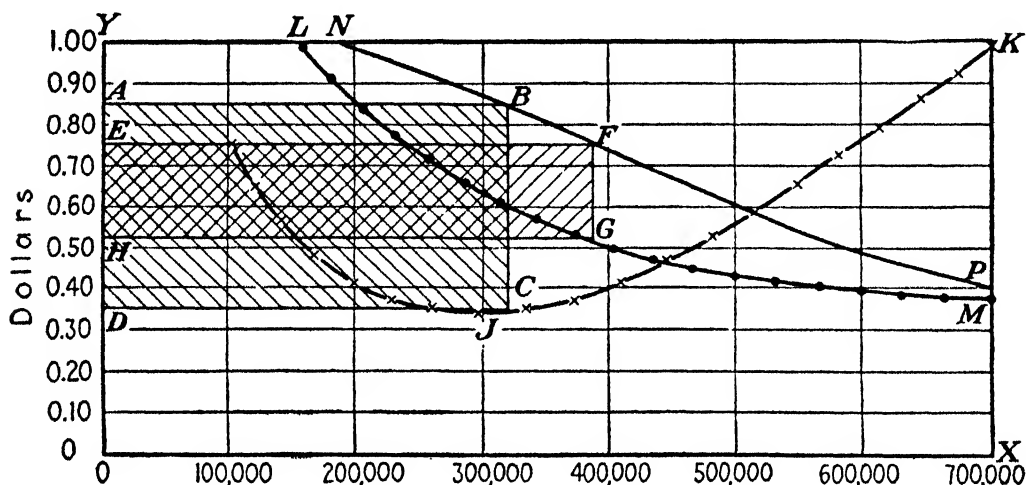


FIG. 33.—Prices and unit costs from Tables 39 and 40.

industry: Each producer curtails output because it is to his individual advantage to do so. In agriculture it is not advantageous for any one farmer to act in that way if he is the only one who limits production. He should restrict output only when prices decline faster than costs, but as long as he obtains a profit he should produce more than the output in his least-cost combination.

The Relation of Unit Cost to Monopoly Price.—The foregoing analysis of monopoly price has been given in terms of total receipts and total cost. The problem also may be treated in terms of unit price and unit cost, as shown in Fig. 33. The point of operation is determined by the greatest rectangle which can be drawn between the curves of unit cost and price and the OY axis of zero output. This rectangle represents net profit. Thus the unit-cost curve from Table 39 is LGM and the price curve is

NBFP. The greatest rectangle of net profit is *EFGH* so that nearly 400,000 units should be sold in order to secure the maximum net profit. Since the point of least cost is beyond 700,000 units, a considerable degree of excess capacity must exist under these price and cost conditions. It should be evident, however, that a price reduction would not be a satisfactory means of utilizing additional capacity, for net profits thus would be curtailed.

The unit-cost curve for Table 40 is *JK* and the maximum net-profit rectangle for this particular cost situation is *ABCD*. The best output is over 300,000 units. The point of least cost is at *J* so that operation occurs at a slightly larger output. Evidently a less elastic (steeper) price curve would encourage restriction of output, while a more elastic (flatter) curve would make plant expansion desirable unless all costs would be raised materially thereby. Thus it should be possible for the monopolist to construct a plant whose point of greatest profit would almost coincide with its point of least cost, providing a larger plant does not necessitate a marked increase in unit cost. The behavior of cost in relation to size of plant is thus significant in determining monopolistic expansion. As we shall see, it is also significant in determining whether a given industry shall be competitive or monopolistic in nature.

Causes of Monopoly.—The causes which lead to the creation of monopolies may be divided into two groups. Most legal monopolies are due to public policy. Copyrights, patents, and trade-marks are the basis for many legal monopolies, but the first two are granted by government authority for a limited period. Thus a patent may be held for a period of 17 years and a copyright for 28 with the privilege of renewal for an additional 14 years. Trade-marks do not have such a limited life. These forms of legal monopoly are granted to protect the right of private property in an idea or discovery, and to encourage and perhaps make profitable the development of new ideas from which the public as a whole may be expected to benefit. A large proportion of our present-day quasi monopolies are based upon these legal rights and so are able to influence prices through the control of supply.

A second group of monopolies exists for another reason. They are able to produce more cheaply than any possible competitor and so can retain the market for themselves without this type of

legal assistance. Some managers are more efficient than others. Their plants will have lower production costs or other advantages which permit them to undersell competitors. If the size of these plants can be expanded without losing their economic advantages, they may come to supply the whole market as monopolists free from competition.

Decreasing and Increasing Unit Costs.—Economists have long debated the question: What happens to unit costs as an industry expands? Do they decrease or increase? The attitude for many years has been that the extractive industries, and particularly agriculture, are subject to increasing costs. Thus it is said that a greater food supply can be obtained only at the expense of a more intensive cultivation and the use of poorer grades of land. On the other hand, manufacturing industries have been classified as subject to decreasing cost. Hence it is felt that an increase in the scale of operation in this field leads to lower and lower costs of production. We may seriously doubt the validity of this distinction.

The analysis presented in Chap. XIII indicated that output increases either proportionally to input or less than proportionally as additional factors of production are utilized, but that at some point maximum output will be attained. The chapter also indicated the additional fact that unit cost might fall throughout the stage of proportional output, and at least part way through that of less-than-proportional output, but that cost must rise when maximum output is reached. Thus a particular least-cost arrangement of factors always appears under given conditions. If this point has been passed in the process of expansion, we find unit cost rising. Thus agriculture is said to be an example of increasing costs owing in reality to the fact that it is a competitive business which must operate beyond the point of least cost if profits are to be maximized.

On the other hand, many industries are said to be cases of decreasing cost because the process of adjustment to the best size has not yet been completed. We must take care, however, to note that usually it is incorrect to speak of a competitive industry as subject to decreasing costs if it is assumed to be *in equilibrium*—if the organization of that industry is assumed to be a stable one. If individual plants in a competitive industry were subject to decreasing costs, each manager would cut prices to

secure a larger share of the market for himself. Thus he would obtain greater profits because of reduced cost. This process could be expected to continue (1) until all producers experienced increasing cost, or (2) until only one producer was left in the market, providing demand is sufficiently elastic to make this expansion profitable. Thus the economies from large-scale operation may be responsible for the development of monopolies. Therefore if the sole monopolist is subject to decreasing costs we may be sure that his investment has been poorly made because he has excess capacity, or that his market is expected to expand in the future, as when a higher degree of prosperity prevails.

Dividing Up the Demand Schedule.—The foregoing discussion has assumed free competition on the part of buyers, so that whatever price the monopolist established will be paid by all purchasers alike. The monopolist, however, would prefer to charge each buyer the maximum amount he is willing to pay without reference to the prices paid by others. In other words, the monopolist would like to undertake personal discrimination. Usually he is unable to do so as between individual buyers, but he often may succeed in charging different groups of buyers different prices for the same commodity. This point was mentioned in the discussion of "dumping" but we now are prepared to examine the underlying theory.

The assumptions are (1) a situation of quasi monopoly, (2) large excess capacity, and (3) the presence of noncompeting markets because of foreign sales in addition to domestic sales or because of multiple brands which conceal the fact that the same article is sold at different prices. This situation is illustrated in Fig. 34. In market I the sales price is so related to unit cost that the monopolist produces OM units at a cost of $MC = OA$ dollars and receives the maximum profit area $ACDB$ dollars. However, OM units are obtained at a scale of production much less than the least cost volume OP . Market II yields a sales price which is lower than unit cost at any volume, yet the monopolist may sell in this market at a profit providing a sales price therein is above the direct cost of producing the additional units. Thus if he offers the quantity MN units, the price will be $NV = MS$ dollars, while the cost— $NT = MR$ dollars—of producing the additional units is determined by the median value F of the additional marginal costs JH . The

net profit in market II therefore is $RTVS$ dollars although the sales price NV is less than either the average cost NK or the marginal cost NH for this volume. This situation serves to explain one of the leading reasons for the multiplicity of brands, since the use of many brands on the same merchandise allows the seller to divide up the demand schedule so that some buyers pay more for an article than do others. If all the buyers in Fig. 34 were required to pay the same price, those in market II could not be supplied at all.

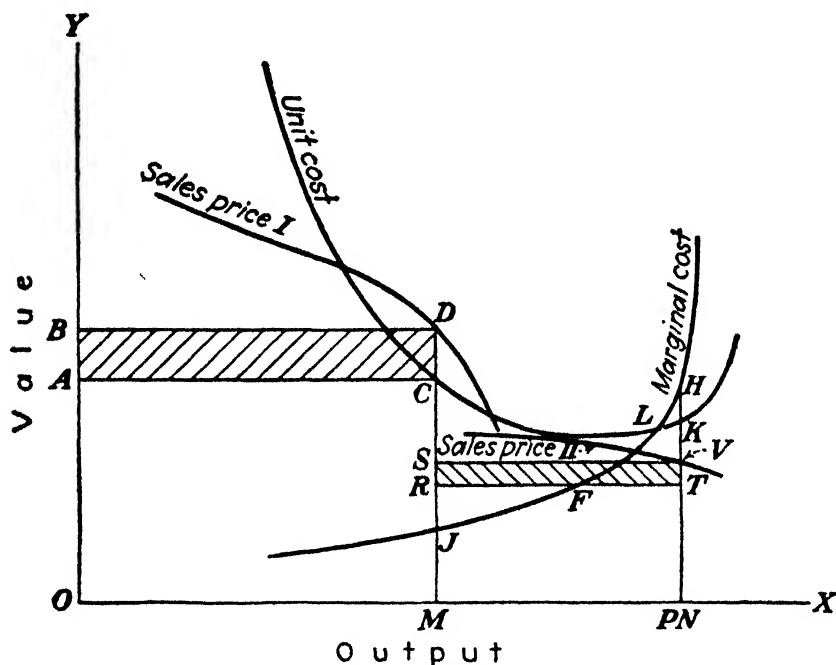


FIG. 34.—Output, prices, and costs for the theory of multiple brands.¹

Whether the Robinson-Patman Act, discussed in Chap. VI, would prohibit the situation illustrated in Fig. 34 is difficult to say. Certainly market II is not charged with overhead expenses, but if this dual-price policy is outlawed the buyers in the second market will be unable to purchase the article, the consumption of this commodity will be reduced, and the standard of living of the nation may be lowered accordingly. On the other hand, the Robinson-Patman Act may assist many small-scale enterprises that now suffer because they must pay more for supplies than do their larger and more favored competitors.

¹ F = Median value of marginal costs from J to H for the output MN .
 F = Average of variable costs of producing MN additional units.

Thus the purpose of the act is to prevent certain harmful aspects of monopoly and so to encourage freer competition.

Consolidations.—The consolidation of individual enterprises is one common method by which businessmen hope to bring supply under control, to raise prices, and to enlarge profits. The discussion above, however, should indicate that large gains from consolidation for this purpose would not always be realized. This conclusion is borne out by the results of a study by A. S. Dewing of the earnings of twenty-nine industrial consolidations which he selected at random. Less than half of these consolidations secured earnings the first year that were as great as the earnings of the original individual plants. Over a 10-year period, this situation was true of three-fifths of the consolidations, while only one-sixth obtained earnings as great as those anticipated by their promoters. The problem is complicated, of course, by the fact that a single management takes the place of many managements upon the consolidation of industries. It is possible that the organization thus becomes too large for such centralized control to be conducted efficiently. Nevertheless, the elasticity of purchase undoubtedly played a very significant part in thus restricting the monopolistic efforts of these consolidations. Relative freedom from competition is no reason for supposing that the monopolist therefore can demand an exorbitant price. In other words, charging what the traffic will bear does not necessarily involve extortionate charges.

Open-price Associations.—Another means by which competition may be reduced, and by which a higher degree of unified action may be secured in price determination, is through the establishment of trade associations and open-price associations.

A trade association is an organization of producers, or distributors, of some commodity or service upon a mutual basis for the purpose of promoting the business of their branch of industry and improving their service to the public, through the compilation and distribution of information, the establishment of trade standards, and the cooperative handling of problems common to the production or distribution of the commodity or service with which they are concerned.¹

¹ Reprinted from *The Proceedings of the Academy of Political Science*, New York, Vol. 11, No. 4, January, 1926, article entitled Trade Associations and Business Combinations.

The open-price association is a particular type of trade association, with a particular purpose, *i.e.*, the reduction or elimination of price fluctuations or unfair or discriminatory methods of competition as regards price. The open publication of past price quotations is generally supposed to be sufficient for this purpose. The theoretical proposition at the basis of the open-price policy is that knowledge regarding bids and prices actually made is in itself sufficient to keep prices at reasonably stable and normal levels. Trade associations proper may or may not have anything to do with the open-price plan; the two may be entirely separate. On the other hand, the present legal status of certain open-price activities has led some trade associations to include the open-price plan as one of their services to members. The importance to consumers and to industry at large of an adequate service of business statistics cannot be overemphasized, since it serves to enhance the stability and soundness of general business conditions. Thus engineers have pointed out that such associations

. . . should collect and make public trade information, including current data on production, stocks on hand, consumption, the general price levels of essential commodities, and statistics of active and idle plant capacity. Such information would make for stability and elimination of waste.¹

Publication of information in regard to past transactions may stabilize prices, and such an event usually would not be frowned upon by the courts. More exact and timely knowledge of market conditions may even result in lower prices in many cases, since accurate information serves to reduce business risks. This situation is highly desirable from the economic-efficiency viewpoint and is sanctioned by the courts as well.

Résumé.—In Chap. XIV we said:

Here is a motorcar selling for \$875, hosiery for 99 cents a pair, coats at \$98.50, a suite of furniture for \$169.75, a radio set for \$69.98, and so on. Why are these prices as they are? Why does the radio set not sell for 99 cents or for \$875? Why should it be offered at \$69.98 instead of \$70?

The radio set does not sell for \$875 because of the *elasticity of demand* for such an article, nor does it sell for 99 cents owing

¹ Committee on Elimination of Waste in Industry, "Waste in Industry," Federated American Engineering Societies, 1921, pp. 24-33.

to the *costs of production* that must be incurred if radio sets are to continue to be offered on the market. These points were explained in the discussion of competitive prices in Chap. XIV. Answers to the remaining question, *i.e.*, why should the radio set be offered at \$69.98 instead of \$70, have been indicated in the explanation of controlled prices, wherein a number of methods of determining retail prices were set forth. One general set of pricing problems, however, has not yet been treated. Prices sometimes are determined directly or indirectly by governmental authority, and it is to this aspect of the subject that attention is to be directed in Chap. XVI.

Problems

102. Draw a supply and demand curve to illustrate the bargaining range. What determines the exact price that will be charged under the conditions indicated?

103. State the principle of monopoly price determination. Contrast it with competitive price determination. Under what conditions might monopoly price be as low as or lower than competitive price?

104. Do you believe that the study of twenty-nine consolidations referred to in this chapter proves that consolidations, as a rule, are not profitable? Why?

105. Does it make any difference to society whether a given industry, or any industry, is subject to increasing or decreasing costs? Explain carefully.

106. Using the data given in the table, find the price a monopolist would set. What are his profits at this price? Is he subject to increasing or decreasing unit costs? Why? How do you explain this fact?

Price	Demand	Cost
\$10	100,000	Fixed expenses are \$1,000,000; variable expenses are \$2.50 per unit produced.
9	150,000	
8	200,000	
7	250,000	
6	300,000	
5	375,000	

107. What is a trade association? What are its advantages and disadvantages (1) for the businessman and (2) for society?

References

Note. See references at end of Chap. XVI.

CHAPTER XVI

CONTROLLED PRICES

Under competition, as shown in Chaps. XIV and XV, a definite price or a range of prices is established. Prices may be so low as to force some producers out of business and to cause others to combine for security, or they may be so high as to entice new producers into the field and perhaps lead to a curtailment of buying. But whether prices be high or low many producers through combinations and agreements of various kinds continue to attempt price control in the interest of higher profits. Sometimes these efforts are unsuccessful because new producers may appear, because buyers may turn to substitutes, or because agreements may be violated by some or all of the producers. Sometimes, too, attempts at price control are thwarted by the intervention of the government.

Early Reliance upon Competition.—The early economists placed great faith in competition. To them it meant fair prices to producers and consumers alike. Just as a thermostat automatically regulates the heat of a building, so it was thought that competition automatically would regulate the price system. Among businessmen this view also was commonly accepted. More than one Chamber of Commerce speaker chose for his subject: *Competition Is the Life of Trade*. Furthermore, this doctrine became the basis of many regulatory laws passed in the interest of the public.

Competition Is Inefficient.—Competition, however, has distinct shortcomings, which gradually were recognized. Its operation involved numerous inefficiencies. Waste appeared on every side. The producers themselves often took the initiative in attempts to remedy the situation. They would either “freeze out” some of the weaker members and combine those surviving the process, or reach a mutual understanding such as a price agreement, a division of business, or even a division of earnings. Whatever advantage the consumer may have enjoyed

during price-cutting wars he often paid for dearly later on by higher prices or by sacrifices in the quality of the goods and services purchased. Furthermore, as long as the government looked upon competition as the panacea for all his needs the consumer could expect but little relief from other forms of control over problems of price and quality.

The general attitude toward competition is undergoing a marked change. Already it is recognized that in the interest of the buyers themselves, some prices must not be subject to competition. The prices of certain goods and services must be regulated, it is becoming increasingly clear, because they are affected with a public interest and are produced and dispensed by industries with monopolistic tendencies. If prices are fixed directly by some outside authority, or indirectly by regulations of one type or another, competition has had no direct part in the process, although often it must be recognized as a contributory factor. The lack of competition requires any price-fixing body to develop new principles of price determination that will take the place of the discarded self-adjusting competitive process.

I. PRICE FIXING UNDER GOVERNMENT SUPERVISION

Insurance.—Insurance serves as an example of a business in which unregulated competition proved to be so unsatisfactory for both buyer and seller that the state governments finally were obliged to take a limited part in the fixing of rates. This rate determination often is done indirectly. In fire insurance, for example, premium rates usually are determined by rating bureaus subject to state supervision. These rating bureaus set rates that are closely followed by the members; price as a factor in competition is thus partially eliminated. Furthermore, the state insurance laws, by stipulating the method of computing the reserve that shall be kept by the fire insurance companies, indirectly help to determine premium rates.

Another example is workmen's compensation insurance. The government establishes in advance the amount of compensation that will be paid for various types of injuries. All insurance companies and all injured persons of a given class thus are placed on the same general basis. If the state sells the insurance through a state fund, the premium rates are determined for those employ-

ers who insure with the fund. Yet in neither fire, liability, nor life insurance is there absolute fixation of premiums. Moreover, the degree of price competition that actually exists usually is amplified by competition in the terms of service rendered and, in some cases, by a reduction in "net" rates through refunds.

Interest Rates.—Federal reserve banks under the supervision of the Federal Reserve Board of Governors, a government agency, fix rediscount rates. These rates usually are set within limits bounded by commercial paper rates and bankers' acceptance rates. Since both commercial paper rates and bankers' acceptance rates depend upon market conditions, it may be said that the reserve banks set their rates with reference to the general business situation, though it is true also that market conditions are subject to influence from rediscount rates.

Direct Government Price Limitation.—During the World War, the government fixed limits to the prices of such leading articles as wheat, iron, steel, lumber, and copper. The purposes of this procedure were to insure an adequate supply of these commodities for the more pressing uses, to prevent profiteering in their sale, and to stabilize their markets. For example, the government wished to increase the production of wheat. Under the terms of the Lever Act a *minimum* wheat price of \$2 was set for the 1917–1918 crop. The President later raised the minimum to \$2.20. This price guaranty made it possible to grow wheat profitably on land that had not been used for wheat under ordinary circumstances. Wheat production was increased considerably, but current dust-bowl and price problems have appeared as a disturbing aftergrowth of this intervention by the government.

In order to stabilize the iron and steel markets, the government in 1917 fixed maximum prices for iron and steel which generally were much below the prices that had been in existence in previous months. Table 41 shows the points at which prices were fixed. These price adjustments were facilitated by the high degree of organization in the iron and steel industry. Output was maintained at a satisfactory level in spite of price fixation.

In England price fixing was utilized more extensively than in the United States. Certain commodities were bought outright and distributed by the government, sometimes at a loss and sometimes at a profit. In the basic industries, such as iron and coal, the government usually fixed a minimum as well as a maximum

TABLE 41.—PRICES FIXED SEPTEMBER 24 AND AVERAGE JULY QUOTATIONS, 1917*

Commodity	Fixed price	Average July price
Iron ore, non Bessemer (51.5 percent iron per gross ton)	\$ 5.05	\$ 5.05
Coke, blast furnace (per net ton).....	6.00	12.75
Steel bars (per hundredweight).....	3.00	6.00
Plates three-sixteenths thick or heavier, (per hundred-weight).....	3.25	9.00
Bessemer billets (per ton).....	47.50	100.00

* *Iron Age*, Sept. 27, 1917, p. 756; Oct. 4, 1917, p. 833.

price and, if costs exceeded the minimum price, the government made up the deficit by a subsidy. Prices also were fixed in other countries engaged in the war.

Export Monopolies.—A widely discussed problem of government price fixation in recent years concerns control of exports of industrial raw materials and foodstuffs. This type of restrictive policy is far from new, for it frequently was employed by mercantilists in the seventeenth and eighteenth centuries. Its revival has been encouraged because modern industrial nations have become increasingly dependent upon foreign sources of supply for certain raw products. Thus every country which has a more or less complete monopoly of a particular raw material has an incentive to exploit the advantages of its unique position.

A marked development of export controls has appeared in the last 30 years. Not only has control become more active and thus more effective in many cases, but also the number of commodities subject to control has increased. Some of the more important commodities now or recently subject to such control are:¹

Camphor (Japan).	Pulpwood (Canada).
Coffee (Brazil).	Rubber (British Malaya).
Cotton, long staple (Egypt).	Silk (Japan).
Mercury (Spain, Italy).	Sugar (Cuba).
Nitrate (Chile).	Tin (British Colonies).
Potash (Germany, France).	

¹ WALLACE, B. B., and L. R. EDMISTER, "International Control of Raw Materials," Brookings Institution, 1930, Appendix A.

Export control usually has been established for one or more of the following reasons: (1) To obtain public revenue by means of an export tax, (2) to maintain or increase the profits of domestic producers, (3) to foster and extend domestic manufacturing industry by means of especially low raw-material prices, (4) to conserve natural resources, (5) to impose penalties on aggressor nations in wartime, and (6) to prevent accumulation on other nations of credits which cannot be transferred to the exporting nation because of exchange-rate disturbances. Governments have not been uniformly successful in realizing these aims. The pitfalls in the way of adequate export control and, indeed, of minimum price control for any raw material, may be illustrated by reference to coffee "valorization" in Brazil.

Brazilian Coffee Valorization.—The intervention of the state and federal governments of Brazil in the production and marketing of coffee represented an attempt to deal with two distinct and difficult problems of supply. One, not unlike that which occurs with cotton, was the problem of stabilizing prices for a crop that fluctuates markedly from year to year. The other, similar to that which arises in the case of rubber, was the problem of adjusting supply to demand when the crop does not come into bearing until six or seven years after the season in which it was planted.

For many years Brazilian planters found the price of coffee remunerative and they rapidly replaced corn, rice, beans, and other crops with coffee. Coffee consumption throughout the world increased steadily, but not so fast as production. Thus stocks on hand gradually accumulated. The climax came with the unprecedented crop of 1901–1902. Panic was followed by depression. Mortgages on plantations were foreclosed and revolution threatened. The demand for state aid became insistent.

With prospects of another bumper crop in 1906, the state of Sao Paulo adopted a policy of *valorization* late in 1905: A surtax on all coffee exported provided the state with funds that were used to purchase coffee to be withheld from the market in order to prevent a rapid price decline. The policy was successful, especially since the coffee purchased by Sao Paulo was replaced on the market very gradually, the last bags being disposed of in 1918. In addition to saving its chief industry from immediate

ruin, the state of Sao Paulo provided for the future when it discouraged the further planting of coffee trees by a tax on all new plantings not intended merely to replace old trees. If this necessary step had not been taken, the increased profitableness of coffee growing which resulted from enhanced prices would have led to a domestic surplus so great as to break down the state's attempt at valorization.

The first valorization, just described, was begun in 1905 and liquidated in 1918. The second valorization, 1917-1920, and the third (which was conducted by the federal government), 1920-1923, were quite successful, not only in moderating price recessions but also in returning handsome profits to their promoters. As a result, continuous regulation was begun in 1925. The system had failed by 1929, however, since production outside Brazil could not be restrained. Thus prices eventually fell very low and all attempts at control were abandoned.

The American Farm Problem.—The great encouragement to agricultural production which resulted from the high prices of the World War period led to a marked expansion of output. Many persons undertook to cultivate areas which previously had not been brought under the plow, while others cultivated more intensively land already in use. Farmers mortgaged their property either to acquire additional land or to obtain new farm machinery. After the cessation of hostilities other regions returned to agricultural pursuits and the competition of these and the new farming regions forced the prices of leading crops to a low level. The farmer's income thus fell much more rapidly than his cost of production, as shown in Fig. 35.

The burden of farm debt was greatly enhanced by this fall in farm prices, so that a much larger proportion of agricultural produce was required to meet mortgage payments than before. The depression of the 1930's further emphasized this burden. Many farmers lost their land, and many credit institutions held loans which it seemed could never be repaid. The severity of this debt burden, the large number of persons adversely affected, and the marked shrinkage in markets for manufactured goods which resulted led the government to seek a solution for the unusually depressed condition of the agricultural industry.

The Agricultural Adjustment Administration.—A number of bills were introduced in Congress in the postwar years which

sought to relieve the farm problem. The most popular measures were based upon an attempt to raise prices through government purchase of crop surpluses. If this general method should succeed in raising prices it also inevitably would raise production so that the government would be forced to buy increasing amounts of

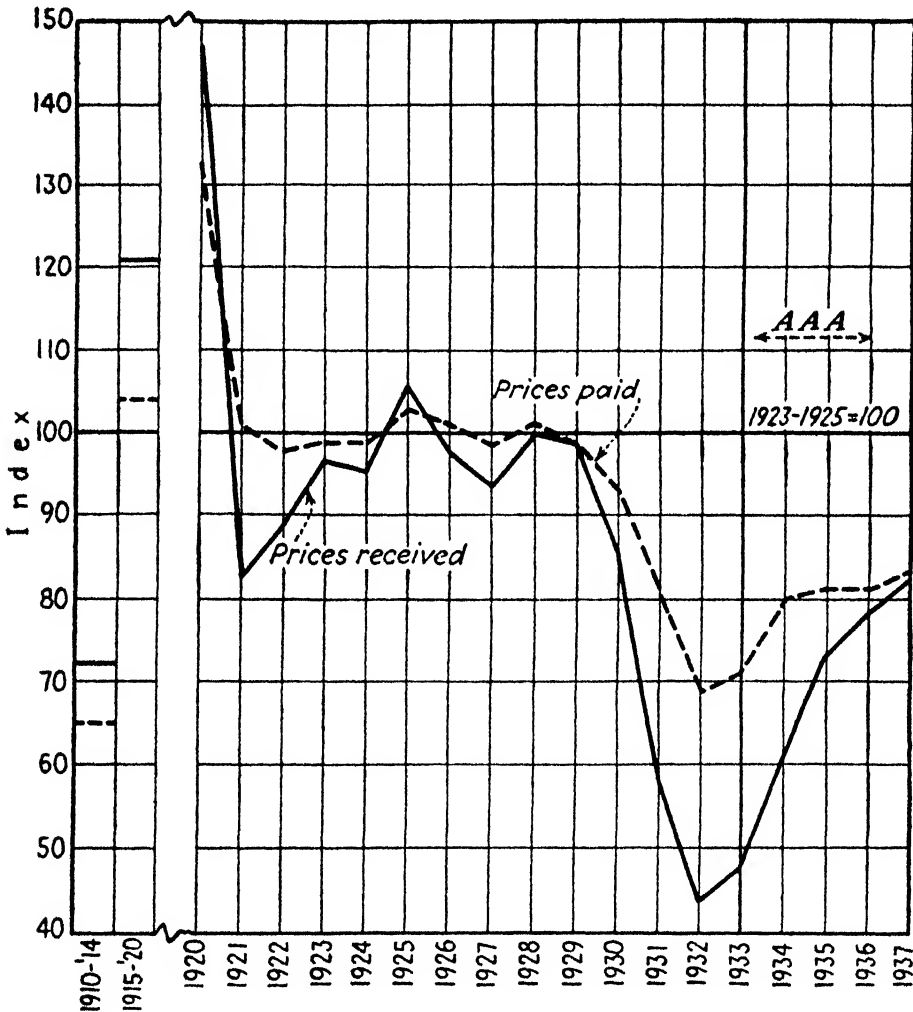


FIG. 35.—Index numbers of prices received by farmers and prices paid by farmers for selected years.¹

crop surpluses until it became bankrupt. The experience of Brazil and other countries has proved conclusively that raw-material prices cannot be raised artificially with success unless production simultaneously is curtailed.

In order to avoid this difficulty, the Emergency Farm Relief Act of 1933, declared unconstitutional by the Supreme Court in

¹ "Statistical Abstract of the United States," 1929, p. 642; 1936, p. 606; AAA releases, 1937, 1938.

January, 1936, provided for the Agricultural Adjustment Administration. The AAA, as it was called, established a program of crop reduction for leading commodities. The Secretary of Agriculture was empowered to enter into contracts with farmers which called for acreage reduction or curtailment of production for market. By way of compensation the cooperating farmers received rent for land leased out of production or benefit payments for the restricted allotments grown. Farmers who failed to cooperate could produce as much as they wished, but they could not participate in benefit payments.

The cost of the benefit payments was to be met through taxes on the first domestic processing of the products. Thus the burden of agricultural aid rested upon the general consuming public. The justification for this condition was declared to be the fact that a restored agricultural industry would provide markets for manufactured products and the expansion thus engendered would reduce unemployment and so would aid the public as a whole.

Success of the AAA Program.—We may seriously question the desirability of general crop restriction at a time when many people were living on reduced diets or were suffering from partial starvation, but if we accept the statement that immediate restoration of agricultural prices was a necessity, this method perhaps was the only workable one at hand. It sought to raise prices by the restriction of supply. Therefore it did not carry within itself the most important seed of ultimate failure, namely, high prices without limitation of production. Economically speaking, the program rested upon a sounder base than did those proposed before the depression.

The actual success of the program cannot be determined readily. Farm prices rose 50 percent from the date of its inception to the beginning of 1936. The cost of the farmer's purchases rose only 15 percent in the same period. The AAA program cannot be given sole credit for this improvement in the farmer's position, however, for other factors undoubtedly played a part. Thus adjustments of non-controlled crops to the new market situation occurred, so we may assume that similar changes would have appeared in the controlled crops if they had not come under the AAA plan.

Weaknesses of the AAA.—The AAA program evidenced certain weaknesses during its life. Thus acreage control alone is not

necessarily sufficient to limit the amount of a crop that appears upon the market unless the intensity of cultivation is subjected to control as well. Furthermore, the limitation of farm activity on one crop often led to greater production of non-controlled products so that their prices were depressed in turn. The tendency thus might have been toward a compulsory control over all agricultural activity, if the program had continued and if the need for action had not been reduced. Finally, the processing taxes tended to curtail the use of the very products whose consumption should expand. Unless the demand is quite inelastic, then, the cost of such a program should be defrayed in some other manner which would not affect the majority of consumers in this way.

The "New" AAA.—When the AAA was declared unconstitutional in 1936, Congress promptly passed new legislation to obtain the same results in a manner which it was hoped would prove to be consistent with the Constitution. Under the new law, the general funds of the federal government are used to encourage soil preservation and flood control. These measures are assumed to involve what is definitely an interstate matter. Thus farmers who plant legumes, such as clover, return nitrogen to the soil; this is conservation, for which they will receive payment.

In 1938 the Secretary of Agriculture was empowered to set a national acreage allotment for each crop each season, based upon production during preceding years. He was also permitted to invoke marketing quotas, subject to rejection by a referendum vote of one-third of the growers involved, whenever national supplies of any crop exceed specified levels. As a further means of controlling farm prices, through control of the supply of products, provision was made in the 1938 legislation for giving cooperating farmers loans on their crops whenever prices fall below a parity established by the Secretary of Agriculture.

Price Control under the National Industrial Recovery Act.—The National Industrial Recovery Act, passed on June 16, 1933, had two purposes. The more important and immediate one was to promote business recovery from the depths of the depression, while a second and more permanent aim was to improve the conditions of competition in industry. The chief purpose was to be attained primarily through higher rates of pay, shorter

hours of work, and the maintenance of prices at levels sufficiently high to permit industry to cover its increased labor costs. The President and his administrators were given wide powers to promote the self-regulation of industry under government supervision by means of *codes of fair competition*. Although direct price control was a secondary factor in NRA, the entire program was closely related to prices at almost every point. Wage rates and total factory pay rolls rose to some extent under the codes, but prices rose to an even greater extent. The general lack of success in respect to price control led NRA to confine most of its attention to competitive practices in the later months of its life, before it was declared unconstitutional by the Supreme Court in May, 1935.

A study of 677 codes¹ revealed that 560 contained some provision relating to minimum prices. The code submitted by the petroleum industry, for example, contained far-reaching provisions for the control of prices of oil and oil products. Petroleum could not be sold below its "recovery" cost and petroleum products not below "average" cost. Provision was made to maintain prices by restricting sales through pooling agreements. Minimum prices could be set by the President for a 90-day period. In the copper industry, producers, refiners, and smelters who agreed to sales quotas and allocation of orders were permitted to call their product "blue eagle" copper, which was made a requirement for all purchases by the United States government.

"Public Yardsticks" in Rate Control.—Another example of indirect control of prices by government agencies is exemplified by "public yardstick" enterprises in the electrical utility field. When generating stations and electrical distribution systems are operated as a public enterprise in competition with privately owned utilities, the rates charged by the private companies are subject to some degree of indirect control as a result of the public competition in electrical service. Many communities enjoy low rates because of this competition rather than because of direct regulation of the rate schedules of the utilities. Furthermore, a monopolistic public plant having no competitors in the area which it serves often leads to low rates in adjoining regions as well because the plant is considered by the general public to

¹ BURNS, ARTHUR R.: "The Decline of Competition," McGraw-Hill Book Company, Inc., 1936.

be a yardstick by which to determine the fairness of rates in that territory. Thus the low rates charged by the Tennessee Valley Authority, for example, have led to rate reductions by the private utilities which supply power for other areas in the South. Similarly, one of the arguments presented in favor of the maintenance of government yardsticks is the assertion that these enterprises permit the government to check upon the costs of ship construction when bids are received for vessels to be built in private shipyards. The effectiveness of public yardsticks in price control depends less upon the competition which they offer to private enterprises than upon the accuracy with which cost data are secured in the yardsticks themselves. For this reason government yardsticks should maintain complete and accurate accounting records of their operations, although in practice they all too often fail to do so.

II. DIRECT GOVERNMENT PRICE FIXING

Taxation.—A common example of direct price fixing by the government is to be found in the determination of taxable value and of tax rates. This determination is carried on by local, state, and federal governments. Many years ago, and even now in a few countries, individuals acquired the right to collect taxes by the payment of a stipulated sum to the government. These "tax farmers" as they were called then proceeded to collect as much from each individual as they could get. Thus a person was not certain of the amount of taxes he would be required to pay. Under government determination of taxable value, and of tax rates, however, this uncertainty has been greatly reduced.

Condemnation.—The judiciary branch of the government also takes a very active part in price fixing. A common example is to be found in condemnation proceedings under the sovereign right of eminent domain. *Eminent domain* is the right or power of a sovereign state to appropriate private property to particular uses for the general welfare. It embraces all cases where the individual's property is taken without his consent for the public good by authority of the state, and is devoted to some particular use by the state itself, by a public or private corporation, or by a private citizen.

When property is taken in this way the owner must be compensated properly for that which he has lost. *Just compensation*

means a fair and full equivalent for the loss sustained by the condemnation for public use. This equivalent may be either more or less than the mere money value of the property actually taken. It may be more if a franchise-value also is appropriated or if but a part of the property is taken and the remainder is damaged by the taking. It may be less if the remainder is benefited by the taking since this "free income" is deducted from the compensation for the part taken.

The judiciary is faced with the problem of determining the value of the property taken, since this value determines whether just compensation has been made. Property valuation, however, is a problem in pricing, for we wish to know what price the property would bring in a normal market. Courts consider this market value of property as the price which it would bring if it is offered for sale by an owner who desires, but is not obliged, to sell it and is purchased by one who is under no necessity of obtaining it. In other words, there should be no compulsion upon the buyer or upon the seller. To determine this value, all the possibilities of the property, all the uses for which it is adapted, are to be considered, and not just the use in which it happens to be employed at the time. For example, a given plot of city land may be used as a parking lot. A public utility wishes to condemn it for use as a terminal, which will yield handsome profits to the utility. Its value is not to be found from its use as a parking lot, or as a terminal, but from *all* its possible uses. The parking-lot value is too low to be just to the seller; the terminal value may be too high to be just to the buyer. Again, public utility property is in a different position from private property. If private property is condemned, the private business conducted upon it can be moved to a new location. If all utility property in a given area is condemned, the utility's franchise to do business is taken along with the other property. Therefore the franchise-value may be included in the condemnation price fixed by the court.

Rate Regulation.—Governments also fix prices directly by means of commission activity. Public utilities are either completely or partially monopolistic in nature. Electric light and power, telephone, natural or artificial gas, and water systems when privately owned usually are given monopolistic rights in the franchises which permit them to use the city streets. Steam

railroads compete strenuously at large terminals but many smaller communities are served by only one railroad. Thus a portion of railway business is non-competitive. Since the public utilities are subject to monopolistic rather than competitive principles of pricing, their rates require regulation. Otherwise the public may be forced to pay excessive rates for service. Experience has shown that the commission' form of control is the most satisfactory, largely because the commissioners may become experts and so can meet special problems as they arise. If the control is directly by legislative enactment, it is not rapidly responsive to new conditions, it is inexpert, and it is likely to become political instead of technical in nature.

Rate Principles.—The regulation of utility rates would be a fairly simple matter if only one class of service were rendered. If a railroad carried just one kind of coal, or if a power plant served only residential users, rates could be based upon the *cost of service* rendered. The power plant would apportion all its expenses in terms of the number of kilowatt-hours of current taken; the railway would apportion its costs in terms of the number of carloads of coal carried.

The determination of rates cannot be based upon the cost-of-service principle, however, because of the diversity of services rendered by utilities. Railroads carry thousands of different commodities in carload and less-than-carload lots; power plants serve domestic, commercial, and industrial users; telephone companies offer local and long-distance, day and night services. Thus it becomes impossible to determine the exact cost of serving any particular customer, since the given facilities are used to serve many customers. The overhead expenses are *common costs* which, in many respects, are like joint costs. The problem of rate determination, therefore, is one of allocating these common costs to the various classes of service in a manner that will be fair to everyone.

Value of Service.—Two methods of allocating the common costs are available, but each method is purely arbitrary. These costs might be allocated equally to each unit of service so that each kilowatt-hour or each carload bears the same share of the overhead expenses. This method is not used in practice because some classes of service are unable to carry this proportion of the common costs. Let us assume that the direct cost, or *out-of-*

pocket cost, of moving a carload of coal from X to Y is \$1 and the prorata share of the common costs is 75 cents. If the coal will be shipped only at a rate which is not in excess of \$1.50, some other method of caring for the overhead costs must be found if the coal shipment is to be handled.

On the other hand, the common costs may be allocated *unequally* to the various classes of services. Those portions of the service which can afford higher rates will carry a larger proportion of the overhead expenses while the portions which must have low rates will be required to pay very little more than the out-of-pocket costs involved. Thus the *value-of-service* principle assumes that rates will conform to the willingness of customers to pay for the service rendered. Those willing to pay a large amount make a substantial contribution to the common costs in addition to meeting the out-of-pocket costs involved. Those who will pay only a small amount contribute little more than the direct costs of the service received.

If carried to its logical extreme, this method of quoting rates would result in a different rate for each customer for each time he would desire service. Public utilities, however, are required by law to serve every member of a given class of customers at the same rate. That is, *personal discrimination* is prohibited. Railroads also are required to observe equality in treatment between various communities. Thus local discrimination is forbidden in most circumstances. The result of these necessary restrictions is the quotation of rates in terms of the *class* of service given, so that the value-of-service principle is used to allocate most of the common costs to those classes which can afford to pay the largest amounts for service. Hence manufactured goods pay higher freight rates per hundred pounds than coal, and industrial power users pay much less per kilowatt-hour than do the residential customers. The complicated rate structures which result are the joint work of commissions and utilities; the former seek low rates to benefit the public, and the latter seek high rates to benefit their stockholders. Thus the prices paid for utility services are the outcome of government control through regulating commissions.

Public Utility Profits vs. Monopoly Profits.—The relation between monopoly price theory, explained in Chap. XV, and public utility profits may be shown by an example such as that

illustrated in Fig. 36. The demand for the service rendered by the utility in question is shown by DD , while the average cost of rendering service is represented by CC . The maximum profit area $afeb$ appears with an output of OM units of service and a price of Ob (or Me) dollars. This area, however, represents a return upon the utility's investment which often is too high. Thus the unregulated utility may be charging exorbitant rates because it occupies the position of a monopolist. The fair return which the utility is entitled to earn we may assume is represented by the area $sprt$, as determined by one of the methods to be described below. Therefore under regulation the rate charged

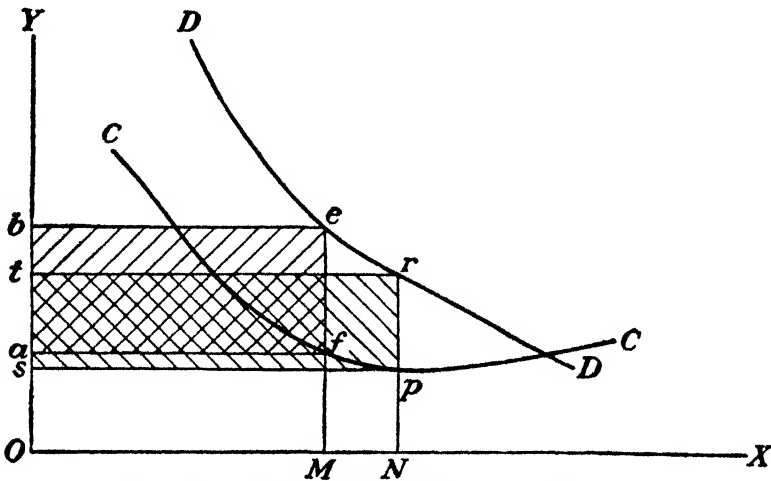


FIG. 36.—Public utility rate determination.

will be only Ot (or Nr) dollars and the output will be ON units of service.

One basic difficulty of public utility regulation may be deduced from this diagram. Suppose the maximum profit area $afeb$ fails to yield the fair return which the utility should receive. What action is available to a regulating commission which seeks to establish rates that will be fair? If the rate is raised above Ob dollars the net profit secured will decrease still further below the fair return; if the rate is lowered in the effort to increase receipts, net profits again will shrink. The commission is unable to carry out the mandate of the Constitution as interpreted by the courts that a fair return must be earned, and the only alternatives are (1) a financial reorganization of the utility which will reduce the costs to a point where adequate profits are obtained, or (2) complete abandonment of business by the utility. In the first case

the investors may lose heavily, while in the second case the public also may lose because it fails to secure public utility service.

Utility Valuation.—The property rights of the public utilities must be respected by the regulating commissions; since the right to receive income is one of the property rights of the utilities, the rate regulation must be fair to the corporations as well as to the public. Thus the commissions' activities are limited by the attitude of the courts regarding a fair return. In order to test the reasonableness of the rates established through regulation the courts must know the valuations placed on the property of the utilities. The rate must permit a "fair return" on a "fair value." The final price determinations of the government's commissions, therefore, are those which, like condemnation proceedings, establish the market value of the property which the utilities are using to serve the public. There is relatively little dispute over the meaning of "fair return" in most cases; the court battles that appear in utility cases are those which rage over the question of "fair value." Several methods of property valuation are in use at the present time and will be examined in order to see how these prices are determined.

Capitalized Earnings.—An equipment factory that earns \$1,000,000 *net* each year for its stockholders may be evaluated by capitalizing the amount of the earnings at a rate of interest. If the generally accepted rate of return in this particular type of business is 8 percent, the plant would be worth \$12,500,000. This method could not apply, however, if the properties of a public utility were under consideration. The prices of the articles produced or serviced in the factory are not under the control of a regulating commission but are set by the forces of the market; the prices charged by the utility are the items to be regulated. Obviously, then, it would be inconsistent to arrive at a valuation by capitalizing earnings when the earnings are the result of the prices charged in view of the valuation. Fair rates, the goal of public utility regulation, are those rates which will yield a fair return on a fair valuation. Suppose now it is agreed that 8 percent is a fair return. Note the vicious circle in which this valuation method finds itself:

Let X = net earnings
and Y = fair value

$$\text{Then } \frac{X}{0.08} = Y \quad Y \times 0.08 = X \quad (14)$$

We wish to determine the reasonableness of X . Is it too large, too small, or just right? From X we derive Y , the fair value. From Y we conclude that X is just right, no matter whether X in fact was too large or too small.

Market Value of Securities.—Suppose the securities of an electric light and power company have a market value of \$50,000,000. Should light and power rates be high enough to yield a fair return (say 8 percent) on this valuation? If we assume that the market value of the securities is determined only by the earning power under prevailing rates, we are merely begging the question. If earning power is large, the value of the securities is high; if earnings are small, the value of securities is low. But suppose the stock has a market value of \$300 per share and pays \$9 annual dividends. Should rates be set to yield \$24 on each share? Once the stock paid annual dividends of \$24 per share would anything prevent its value from going to \$600 or \$800 on an inflated market? This basis of valuation also is unsatisfactory.

Reproduction Cost.—The foundation of the next method of valuation is the theory of *free competition*. The idea is that the prices of reproducible articles under competitive conditions closely approach their costs of reproduction. The market value of the property, which determines reasonableness for the court, may be said to rest upon the present cost of replacing the property. Clearly it is the *depreciated* value of the property that is to be reproduced, but an engineer who is given the task of duplicating the property might ask if he is to reproduce the *physical plant* or the ability of the going concern to *render service*. In practice, the physical plant as depreciated is the criterion.

This valuation method imposes a heavy burden on the consuming public if prices rise, and on the stockholders if prices fall. Suppose a power plant was built at a cost of \$25,000,000 and charged rates to yield a fair return on this investment. If the price level should rise 100 percent, rates should be set to yield a fair return on \$50,000,000, and the stockholders might enjoy a 500 percent increase in dividends without the investment of a penny of additional capital.

Suppose the price level had fallen 50 percent. If the original investment had been made up of \$20,000,000 in 6 percent bonds and \$5,000,000 of capital stock with an implied dividend rate of 7 percent, the annual fixed charges would have amounted to \$1,-

200,000, plus dividends of \$350,000, or a total of \$1,550,000. This sum represents an average rate of return of 6.2 percent. This rate of return on the new valuation of \$12,500,000 (\$25,000,000 reduced by 50 percent) would yield an annual return of only \$775,000, which would fall short of meeting interest requirements alone by \$425,000. The equity of the stock owners would be reduced to zero, and the company would be insolvent simply because of the valuation method used. Reproduction cost, therefore, is a valuation process which will operate only in one direction, *i.e.*, in that of a rising price level, and then may be unfair to the general public.

Original Cost.—Original cost refers to the actual outlay of money at the time of installation of plant and equipment and at the time of later additions. Depreciation should be taken into account in this method as well as in the foregoing one. The basis of the original-cost method of valuation is the *principal-and-agent* theory. Transportation, for example, is said to be a service that the community may provide for itself. If it is provided by private investors instead, they act in effect as agents of the state. Thus according to regular principles of law, agents should receive the customary rate of return whether market value rises or falls; special profits or losses should be borne by the principal. Since the original-cost method measures the sacrifice of the investors, it shows us how much compensation they (the agents) should receive.

Since improper expenditures have been made from time to time in the acquisition of utility properties, the fraudulent and more ill-advised items should not be included in original cost. When these deductions have been made, the value remaining is called the *prudent investment*. It includes only those expenditures which an honest businessman of average sagacity would have made.

Analysis of 366 Valuation Cases.—The courts themselves, for one reason or another, have not shown a high degree of uniformity in their decisions on valuation cases. A summary of 366 decisions handed down between 1920 and 1923 was given in the Supreme Court opinion in the famous Southwestern Bell Telephone case in 1923 (43 SCR 544). The summary appears in Table 42.

Note that twelve cases were based upon capitalization of securities, three on predicted prices, and six on original cost appre-

TABLE 42.—SUMMARY OF 366 COURT DECISIONS ON VALUATION METHODS*
Cases Valuation method

5	Reproduction cost at prices of valuation date.
28	Reproduction cost at prices of date prior to valuation.
12	Reproduction cost at prices of date not stated.
22	Split-inventory method: Reproduction cost of inventory at prior date at prior prices plus additions at cost.
3	Trend-price method: Reproduction cost at future predicted prices.
<hr/> 70	<i>Total reproduction cost.</i>
85	Original cost (both original investment and additions).
6	Original cost arbitrarily appreciated.
28	Book cost or book investment.
27	Prudent investment.
<hr/> 146	<i>Total original cost.</i>
12	Bond and stock capitalization.
138	Exact classification of method impossible.
<hr/> 366	<i>Total cases reported.</i>

* Quoted from S. DAGGETT, "Principles of Inland Transportation," 1st ed., Harper & Brothers, 1928, pp. 352-353.

ciated by some arbitrary figure. Clearly some of these methods are superior to others; some, indeed, are so inexact that they should not receive any serious consideration. It is for this reason that a clear statement of valuation procedure is so urgently needed by commissions and lower courts.

The Supreme Court and Valuation.—In the first valuation case, decided in 1898, the Supreme Court said:

The original cost of construction, the amount expended in permanent improvements, the amount and market value of its bonds and stock, the present as compared with the original cost of construction, the probable earning capacity of the company under particular rates prescribed by statute, and the sum required to pay operating expenses . . . are to be given such weight as may be just and right in each case.¹

Many decisions on valuation cases have been handed down by the court since that time, but lower courts and federal and state regulating commissions still find it difficult to determine the exact valuation method that will be acceptable to the court. Since the Supreme Court seeks to determine the market value of the utility's property on the basis suggested above in the discussion of condemnation value, it is evident that a single formula for market value is unlikely to prove acceptable in all cases.

¹ 169 U. S. 466.

Experts in the field of utility valuation, however, feel that either of two methods will be accepted under proper conditions.

If the property of a utility is to be valued on the basis of *original cost*, the accounting records must be complete from the birth of the business to the moment of valuation. Careful and expert analysis of these records then will yield a value which the court will approve. The books of many corporations are incomplete, however, because accounting technique has been expanded greatly since they were organized and because early records in many cases have been misplaced or destroyed. In this event the only alternative is to use the reproduction-cost method of valuation. Apparently the court will accept a *reproduction value* only if prices at the date of valuation are used, and many cases have met with an unfavorable reception because these "spot prices" were not employed. No matter which method is followed, the work of valuation must be technically competent. The court will not approve of estimates but demands the facts in each case. This situation makes successful valuation a difficult matter and has called for the services of engineers to an increasing degree.

The Relation of Engineers to Valuation.—The significant role now played by engineers in valuation cases is due to the increasingly common use of the reproduction-cost method. The foregoing discussion indicated that the procedure in the determination of original cost involved only the work of accountants, who derive the valuation from the books of the corporation. The procedure in the determination of reproduction cost is quite different. Three steps usually are involved. First, engineers must make a physical inventory of the entire property of the utility. At the same time they estimate the degree to which the various parts of the property are worn out; thus the extent of the depreciation is known. Second, current market prices for the various items of inventory are found. The application of these prices to the inventory gives the major portion of the valuation. Third, certain intangible items are added to arrive at the final valuation. The chief item is *going concern value*. It indicates the difference in value between so many rails, cars, locomotives, and terminals as physical units and their value when organized into a going concern which is transporting goods as an operating unit. Other items are good will and franchise-values. These items are significant in determining the value of a competitive business, but

they should not be included in the value of a monopoly and especially not in that of a public utility. Nevertheless they are included in many valuations.

Depreciation.—Depreciation plays a very significant role in valuation. If a utility claims to depreciate its property more rapidly than actually is the case, its cost of operation will appear to be greater than it is in fact. Thus it could justify a higher scale of rates than those to which it is entitled. Both the accountant and the valuation engineer must be quite familiar with depreciation procedure if they are to be competent experts in this field.

There are a number of formulae for calculating depreciation and salvage values. For example, the simple "straight-line" formula is:¹

$$C_a = C - A \left(\frac{C - C_n}{N} \right) \quad (15)$$

where A = the age in years, for which salvage value is sought.

N = the life of the structure in years.

C = the first cost of the structure.

C_a = the salvage value of the structure at age A years.

C_n = the salvage value of the structure at the end of its life.

The salvage value at the age of ten years of an electric light plant which cost \$10,000,000 and which was expected to lose all salvage value in 20 years would be:

$$C_a = \$10,000,000 - 10 \left(\frac{\$10,000,000 - 0}{20} \right) = \$5,000,000$$

In actual practice, however, the calculation is not so simple. Experts may give testimony to show that the rate of depreciation is different from that which was anticipated. For example, in a midwestern city there was a protracted battle over gas rates. Testifying as an expert witness for the gas company, one engineer said the plant, mains, and other property had a certain value, while another engineer, apparently equally competent, testifying for the city maintained that they had an entirely different value.

¹ J. C. L. Fish gives a very good explanation of these formulae in Chap. XVII of his "Engineering Economics," 2d ed., McGraw-Hill Book Company, Inc., 1923.

Many situations of this type merely indicate the fact that valuation problems are extremely difficult of solution, and that it is often impossible to obtain exactness and agreement even among engineers.

The Time in Which New Equipment Should Pay for Itself.—

Closely related to the general problem of depreciation is the question of the period of time during which equipment should pay for itself. A study of 200 manufacturing concerns gave the results which are plotted in Fig. 37. One-half of the companies

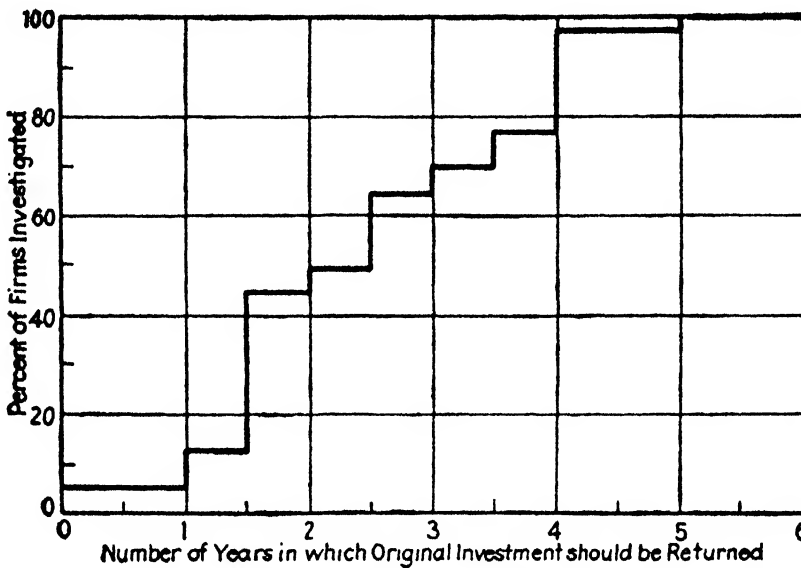


FIG. 37.—Policy of manufacturing firms regarding the purchase of new equipment.¹

depreciated equipment completely in 2 years or less, while four-fifths depreciated their equipment in 4 years or less.

Obsolescence.—The chief reason for this rapid depreciation is the danger of *obsolescence*. The equipment does not wear out in such a short period of use but its place is taken by new and superior machines. If the producer is not to be left behind in the competitive struggle, he must replace his old but quite usable equipment with the newer models which permit somewhat cheaper production. A high rate of obsolescence represents an overhead cost upon society as a whole as a result of rapid technical advance. Its burden is enhanced to no small degree by the competitive nature of many industries under the profit system.

¹ "Recent Economic Changes," McGraw-Hill Book Company, Inc., 1929, Vol. I, p. 139.

Depletion.—The problem of depreciation is aggravated in many industries by the fact that *depletion* goes along with depreciation. Coal mines, gas and petroleum wells, and similar industries must write down their assets annually by an amount which represents the depletion of the store of natural resources with which the business began operation. Usually the exact store of resources cannot be determined when business is begun, so the depletion rate cannot be established with certainty. Thus it becomes necessary to rely upon estimates, which may be subject to a considerable margin of error.

The Consumer's Interest in Valuation.—The problems of valuation arise in the public utility field because of the necessity of substituting governmentally fixed prices for monopolistic prices. The higher the valuation that is established the greater the interest expense and the greater the cost of service to the consumer. Thus the question as to whether public utilities are instruments of public service or corporations for private profit lurks back of every price-fixing problem. The interest of the public and the interest of the security owners come into sharp conflict at this point. The consumer wants rates no higher than absolutely necessary to maintain satisfactory service, whereas the owners desire the maximum return with the least possible outlay.

Overcapitalization.—The statement was made in Chap. V that the overcapitalization of a business did not affect the prices it would charge, and so did not concern ultimate consumers, unless the business happened to be a public utility. We now are in a position to analyze this statement more carefully. First, suppose the business is in a highly competitive market. The price it can charge for goods or services is a constant; overcapitalization will not affect this constant. The quantity it can afford to produce is determined by the relation of its variable expenses to its total receipts; overcapitalization can affect only the fixed expenses. Therefore the capitalization has no effect upon the ultimate consumers of a competitive business.

Second, assume the business is a monopoly. The point of maximum profit again depends upon the relation between variable expenses and receipts; fixed costs play no part in determining that point. The elasticity of purchase is not affected by the capitalization of a concern, for our buying habits have no connection with its financial structure. Therefore the capitalization of

a monopolist has no effect upon his point of maximum profit or upon ultimate consumers.

Third, the rates of a public utility are subject to regulation. If the original-cost or reproduction-cost basis of valuation is used, capitalization should play no part in arriving at the value of the property. However, when valuation cases are before commissions or courts, the utilities frequently succeed in introducing the question of overcapitalization. They argue that the excessive securities are already upon the market and, indeed, in the hands of such innocent investors as widows, orphans, and insurance companies. These investors are entitled to a return. It can be obtained only if the overcapitalized figure is taken as the true value upon which charges to the public are to be based. Commissions and courts sometimes accept the overcapitalized figures and thus require the public to pay more for these essential services than is necessary. Therefore overcapitalization of public utilities *may* lead to excessive charges *if* this fictitious value is substituted for the proper valuation.

Economic Problems Involved in Price Fixation.—Government price-fixing activities raise many disturbing issues. Since prices are interdependent, any interference with one price affects other prices. Moreover, if price regulation is attempted in a field where a number of competitive producers furnish the supply, the price-fixing authority may be forced to enter the market to carry out its policy. For example, if the federal government guarantees a minimum price for food products which is above the competitive minimum already in existence, the government may be required to purchase part of the crop if it is to make its guaranty effective. Since the price guaranty encourages greater production, however, an ever greater quantity must be purchased by the government, unless production is authoritatively restricted.

On the other hand, if the government attempts to establish a maximum price which is lower than the price fixed by competitive forces, it will be faced with the problem of enforcing its policies. So long as output is adequate no difficulties are presented, but if demand outruns supply, competitive buyers will attempt to obtain the goods they desire by open or, if necessary, secret bidding up of prices above the established maximum.

Similar difficulties are encountered in attempts to fix minimum wage rates. Sometimes the process may injure the very persons

it was intended to benefit, for the least efficient employees may be discharged if the minimum wage is set at too high a level. Conversely, the rate may be so low as to be inoperative. Minimum wage fixation, like maximum commodity price determination, however, may result in more efficient production because the inefficient employers or producers are forced thereby to mend their ways or to go out of business entirely.

III. SUMMARY OF COMMODITY PRICE DETERMINATION

Prices are economic values expressed in terms of money. Commodities and services possess value because they are desired and because their quantity is limited. The totality of consumers' bids and sellers' offers determines market prices. Without market prices, there would be no limitation upon the demand for goods and no pecuniary incentive to supply them. This general principle would be true of a barter economy as well as of a money economy. Even a completely communistic society would be obliged to adhere to the spirit of this principle.

Competition is a universal phenomenon, yet competition is no more universal than is the desire to escape it. Sellers wish to avoid competition because it may lower prices; buyers wish to avoid it because it may raise them. Price analysis, therefore, must deal not only with the undercurrent of competition, but also with the ever-present tendency toward monopoly.

Three general methods of pricing function simultaneously in the economic system. Supply and demand as the determinants of price were studied in Chap. XIV under assumed conditions of free competition. Cost was shown to be the most significant factor in supply, and elasticity of purchase in demand. Supply and demand forces together produce an equilibrium price at which the market will be cleared if free competition prevails. Free competition, it was indicated, really exists only in a few highly organized markets, and even there sometimes only in a limited form.

Imperfect competition, and quasi monopoly, such as are to be found frequently in retail and wholesale trade, were considered in Chap. XV. Various sales policies on the part of individual retailers and wholesalers, consolidations, open-price associations, and other types of organizations were shown to depart

from the principle of price determination under free competition in varying degrees, according to their price-controlling activities. The distinctions between competitive and monopolistic behavior were discussed, and monopoly price was shown to rest upon the relation between cost and demand which would yield the maximum net profit.

In Chap. XVI prices again were considered under conditions of control, but of a more stringent nature, in some cases amounting to complete fixation. Here it is not a question of balancing supply and demand schedules under assumed conditions of free competition or of noting the effects of price policies upon competitive prices. Questions of property valuation and depreciation, investor and consumer interests, court decisions, and public policies now are to be faced in addition to the ever-present factors of cost and elasticity of purchase.

Not only will the future probably see more control of prices on the part of businessmen, but also it will undoubtedly witness an extension of control on the part of the government. More control will be exercised in the public utility field. But what are the limits of the public utility field? Milk, coal, and other commodities already have been classed as public utilities in some cases, and other articles may be added to the list before many years have passed. If so, engineers may find themselves called upon to value coal mines, farms, and scores of other types of property in addition to the railroads, power plants, gas mains, and telephone lines that furnish most of the valuation problems of today.

Problems

108. Suppose the university decides to enlarge the campus and so uses the right of eminent domain to condemn and purchase three blocks next to the campus. What is the land worth? Upon what basis should the court arrive at the just purchase price?

109. Can the price of steel be raised by law? Potatoes? The amount of profits? Explain.

110. To what extent should decreasing or increasing cost conditions be taken into consideration in the determination of telephone rates? Electric power rates?

111. The right of way of the New York Central Railroad from New York to Chicago is worth today many times what it cost originally to acquire. Should this fact be recognized in the making of freight rates? Why? Is it? Why?

112. Under what conditions would you, as an investor in power and light company stock, prefer reproduction cost as a basis for valuation for rate-making purposes? Under these same conditions, what valuation basis would you prefer if you were a consumer of power and light? Why?

113. "Since the soft-coal-producing capacity of the United States mines is several times actual needs, the government could make the industry more efficient, and save money for consumers, by setting a maximum price on coal that would drive the high-cost producers out of business." Discuss.

114. Here are four proposals to solve the farm problem. Point out the one you think best and give reasons for your selection.

a. Government purchase, from a billion-dollar revolving fund, of crop surpluses to be sold abroad to keep prices high at home.

b. Making electric power available for farm use at very low rates, losses to be covered by general taxation, thus reducing the farmers' costs of operation.

c. Establishment of a government fund of 50 million dollars for scientific investigation looking toward new commercial uses for farm products, such as the production of paper or artificial silk from cornstalks, thus widening the market for agricultural products.

d. Government purchase of farm land from a billion-dollar fund; the land to be used for park, golf-course and reforestation projects.

115. Suppose a telephone company earns a fair return on its investment, and assume a considerable increase in the demand for long-distance telephone service at night, what is the effect upon the company's cost of operation? Upon its net profits? Upon its rates for telephone service? Relate this example (a) to the principle of "common costs," and (b) to the practice of "dumping."

References

- ANDERSON, B. M., JR.: "Social Value," Houghton Mifflin Company, 1911.
- BURNS, ARTHUR R.: "The Decline of Competition," McGraw-Hill Book Company, Inc., 1936.
- CHAMBERLIN, EDWARD H.: "Theory of Monopolistic Competition," Harvard University Press, 1933.
- CLARK, J. M.: "Studies in the Economics of Overhead Costs," University of Chicago Press, 1926.
- FISHER, IRVING: "Mathematical Investigations in the Theory of Value and Prices," Yale University Press, 1925.
- GARVER, FREDERIC B., and ALVIN H. HANSEN: "Principles of Economics," rev. ed., Ginn & Company, 1937.
- HARDING, C. FRANCIS, and DONALD T. CANFIELD: "Business Administration for Engineers," McGraw-Hill Book Company, Inc., 1937.
- MILLS, F. C.: "Prices in Recession and Recovery," National Bureau of Economic Research, 1936.
- MOULTON, HAROLD G., and associates: "The American Transportation Problem," The Brookings Institution, 1933.
- ROBINSON, JOAN: "The Economics of Imperfect Competition," Macmillan & Company, Ltd., 1933.

ROWE, J. W. F.: "Markets and Men," Macmillan & Company, Ltd., 1936.

SCHULTZ, HENRY: "Statistical Laws of Supply and Demand," University of Chicago Press, 1928.

WARREN, GEORGE F., and FRANK A. PEARSON: "Prices," rev. ed., John Wiley & Sons, Inc., 1933.

WOOTTON, BARBARA: "Plan or No Plan," Farrar & Rinehart, Inc., 1935.

CHAPTER XVII

THE PRICE OF LABOR

The prices of raw materials, semi-manufactured goods, and consumption goods were analyzed in Chaps. XIV, XV, and XVI. The price of labor and the rental or hire of property—in which are included the rates paid for the use of capital and the use of land—remain to be discussed. Economists treat these items as *factors of production*, on the ground that the elements in any business can be resolved into one or more of these factors. The principles which explain the prices received by the factors of production differ to some extent from those applicable to the prices of commodities. Thus this chapter will discuss the factors of production and the price of labor, while the hire of capital and the rent of land will be examined in the following chapter.

I. THE FACTORS OF PRODUCTION

Factors of Production.—Production involves the application of human efforts and services to the raw materials furnished by nature. The *human* or service element in production may be subdivided into *labor* and *management*, though sometimes it is difficult to draw a clear distinction between these categories. The *material* element in production also may be subdivided into *capital* and the *site factor*. The former refers to the purchasing power for production equipment and the latter to the plant's location upon the earth's surface. The classification of the factors of production is thus fourfold:

Factors of production

A. Services.

1. Labor

2. Management.

B. Materials.

3. Capital.

4. Site factor.

The prices paid for the use of the various factors of production bear special names. Thus *wages* and *salaries* are the prices paid

for various kinds of labor; *profit* is the residual “reward” for management; *interest* is the payment for the use of capital; and *rent* is the compensation paid for the use of a given site.

Derived Values.—The outstanding characteristic of the prices of the factors of production is the fact that their values are *derived* from the values of finished goods. Businessmen do not hire labor, land, or capital for the satisfaction of personal wants. These factors have value merely because the products which can be obtained from a judicious use of the factors can be sold to consumers at a profit. The factors of production add utility to commodities. Since consumers will pay to obtain goods possessing utility, as the last three chapters have shown, businessmen will pay to obtain the factors which add that utility and so

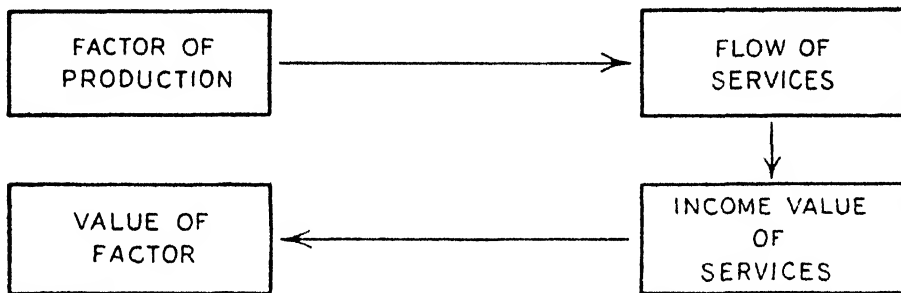


FIG. 38. Illustration of derived value.

create valuable commodities. Therefore the value of the factors is *derived from the value of the products* which can be produced therewith. In other words, the demand for the factors of production depends entirely upon the income which they will yield.

Division of the National Income.—The market for commodities determines the quantity of goods which can be sold at a profit and so limits the quantity produced. The total income obtained from the sale of all the goods and services produced in the country in a year is the *national income*. This income is the sum out of which the factors of production are to be paid. Therefore the division of the national income between the factors is significant. Economists usually speak of this process as the problem of *distribution*, by which is meant the distribution of the various shares in the national product to the respective claimants for those shares. The term “distribution,” however, frequently is confused with physical distribution of goods from manufacturer through wholesaler to retailer. For that reason we shall speak of the *division* of the national income into its respective shares.

Size of the National Income.—It is difficult to secure data which measure accurately the national income and its shares. The figures available are estimates and must be interpreted in the light of the general tendencies they indicate rather than as exact portrayals of the conditions which prevail. In spite of the statistical difficulties which surround the subject, however, we may note certain characteristics from the following information. The five leading sources of the national income, and the percentages contributed by them in 1936 were: Manufacturing, 23.0; government, 14.5; trade, 12.8; service, 12.2; and finance, 9.8. The most striking change in 1936 was the relative contribution of government, which was 61 percent higher than in 1929.

The total national income produced by all sources is shown in Table 43. It is necessary to distinguish between "income pro-

TABLE 43.—NATIONAL INCOME PRODUCED: 1850–1936

Year	National income*	Population	Per capita income	Real income per capita
1850	\$ 2,213,800,000	23,261,000	\$ 95	\$152
1860	3,635,600,000	31,503,000	115	189
1870	6,720,100,000	38,655,000	174	201
1880	7,390,700,000	50,262,000	147	226
1890	12,081,600,000	63,056,000	192	342
1900	17,964,500,000	76,129,000	236	421
1910	30,529,500,000	92,267,000	331	470
1920	67,325,000,000	106,543,000	632	409
1929	81,034,000,000	121,526,000	667	700
1930	67,917,000,000	123,191,000	551	638
1931	53,584,000,000	124,070,000	432	592
1932	39,545,000,000	124,822,000	317	489
1933	41,742,000,000	125,693,000	332	504
1934	48,397,000,000	126,425,000	383	511
1935	52,959,000,000	127,172,000	416	520
1936	63,799,000,000	127,923,000	499	618

* 1840–1910 from W. I. King, "The Wealth and Income of the People of the United States," The Macmillan Company, 1915, p. 158; 1920–1929 from "America's Capacity to Consume," Brookings Institution, 1934, pp. 148–150; 1930–1935 from *Survey of Current Business*, U. S. Department of Commerce, July, 1936, p. 3; 1936 from "Statistical Abstract of the United States," 1937.

duced" and "income paid out." The latter figure is larger in depression years and smaller in prosperous periods than the

former. This situation is true in part because corporations divert a portion of net profits to surplus in good years and continue to pay dividends to some extent in poor years by drawing upon surplus accounts, and in part because government relief expenditures are partly based upon credit expansion. Thus the income actually paid out in 1932 exceeded the income produced by about \$8,800,000,000 while the income produced in 1929 was \$2,400,000,000 in excess of that paid out. The data in Table 43 refer to estimates of income actually produced.

Shares in the National Income.—Estimates have been undertaken in the attempt to determine the size of the shares into which this national income is divided. The data which appear in Table 44 are estimates, but they give some indication of the probable

TABLE 44.—ESTIMATED SHARES PAID TO THE MAJOR CLAIMANTS TO THE NATIONAL INCOME*

Year	Percent of the national income paid as:				
	Wages and salaries	Interest	Rent	Profits	Total
1850	35.8	12.5	7.7	44.0	100
1860	37.2	14.7	8.8	39.3	100
1870	48.6	12.9	6.9	31.6	100
1880	51.5	18.6	8.7	21.2	100
1890	53.5	14.4	7.6	24.5	100
1900	47.3	15.0	7.8	29.9	100
1910	46.9	16.8	8.8	27.5	100
1929	65.5	14.3	4.4	15.8	100
1930	64.8	15.5	3.8	16.0	100
1931	64.4	15.9	3.4	16.3	100
1932	64.0	16.3	3.0	16.7	100
1933	65.2	15.6	3.0	16.2	100
1934	66.3	14.4	3.2	16.1	100
1935	66.4	13.9	3.4	16.3	100
1936	66.5	14.3	3.4	15.8	100

* 1850–1910 from King, *ibid.*, p. 160; 1929–1935 from *Survey of Current Business*, *op. cit.*, p. 4; 1936 from *Survey of Current Business*, June, 1937, p. 16.

division into shares of the national income. The method by which the shares were determined for the earlier period covered by the table undoubtedly was different from that employed for more recent years, but it would seem logical to assume that the

larger share paid as wages and the reduction in the amount of profits at least in part were a result of the increasing extent to which individuals are now employed by corporations with a consequent reduction in the number of independent small-scale enterprises. At any rate, we may say that at present about two-thirds of the national income goes to labor as wages and salaries, one-eighth is paid to the owners of capital as interest and dividends, and one-sixth is received by individuals in the form of profits.

The picture may be further clarified by an examination of the data in Table 45, which show the percentage of those engaged in industry who were classed as employees or as entrepreneurs. Contrary to popular opinion, the small businessman representa-

TABLE 45.—NUMBER OF PERSONS ENGAGED; PERCENT DISTRIBUTION OF EMPLOYEES AND ENTREPRENEURS, 1929-1936*

Year	Number of persons engaged (in thousands)	Percent		Percent of employees on salary†
		Entrepreneurs	Employees	
1929	44,648	22 3	77 7	15.4
1930	42,601	23.4	76 6	17.2
1931	39,180	25.5	74 5	18 0
1932	35,960	27 9	72 1	18.2
1933	35,902	28 6	71 4	16 2
1934	38,355	27 5	72 5	15 7
1935	39,426	27 2	72 8	15 2
1936	41,487	26 1	73 9	15 1

* Bureau of Foreign and Domestic Commerce, "National Income," 1929-1936, p. 20

† Based upon a group of selected industries

tive of individual entrepreneurs is *not* decreasing in importance; he is being forced out of some lines of activity, but is finding new openings in others.

The average income for salaried workers in 1910 was 50 percent more than for wage earners; in 1925 it was only 25 percent more; but in 1936 it was over 100 percent more.

In 1910 non-farm entrepreneurs earned nearly twice as much as did farmers;¹ in 1925 over two and a half times as much. By 1930

¹ Relative *real* income would have to make allowance for additional income, such as food, which the farmer receives.

TABLE 46.—EMPLOYEE INCOME FOR SELECTED YEARS ACCORDING TO TYPE OF PAYMENT*

Year	Average per wage earner	Average per salaried worker
1910	\$ 712	\$1056
1915	765	1155
1920	1187	1891
1925	1667	2091
1930	1318	2552
1935	1061	2174
1936	1142	2333

* 1910–1925 computed from "America's Capacity to Consume," and "The National Income and Its Purchasing Power," *loc. cit.*; 1930–1935 from *Survey of Current Business*, July, 1936, p. 6; 1936 from *Survey of Current Business*, June, 1937, p. 17.

the disparity was still greater; but by 1934 the farmer's income was increasing relatively to that of the non-farm entrepreneur.

Why are such disparities in the shares in the national income typical of our society? Why is the income divided among the claimants to it in this fashion rather than in some other manner? Answers to these questions will be suggested in the treatment which follows in this chapter and the succeeding one.

II. THE PRICE OF LABOR

Labor.—The word *labor* applies not only to physical activity but also to mental activity. Thus in the economic sense of the term a banker or an engineer is as much a laborer as is a ditch digger or a coal miner. Management, however, is to be distinguished in general from labor because of important functional differences. Therefore that larger part of human activity, labor, which takes its orders from the management is the factor of production to be considered in this chapter.

The principal difference between human efforts in production and the services rendered by materials lies in the institution of personal freedom. Today human effort, except in isolated cases, is not to be owned by someone else. Another difference appears in the greater mobility of labor, as contrasted with that of some capital goods and of the site factor, even though it is limited by various family and social considerations.

From the world point of view the supply of labor depends upon the relationship between the birth rate and the death rate, upon

the state of health and physical fitness of the people, and upon the willingness of the population to work. From the national point of view it depends also on emigration and immigration and the laws which limit these movements.

Of the total number of persons in the United States engaged in economic pursuits, 19.5 percent are in agriculture; 21.6 percent in manufacturing; 16.4 percent in service industries; 14.2 percent in trade; 8.8 percent in government service (excluding work relief employees); 6.1 percent in transportation; 3 percent in finance; and the remainder in miscellaneous trades and industries.

The Significance of Wages.—Most persons must work for a living. The size of their pay checks determines, to a considerable extent, the standard of living that they can enjoy. Not only must people work, but also most of them must work for someone else. The industrial revolution literally snatched the tools from the workers, who formerly produced directly most of the goods they consumed, and made it necessary for millions of persons to work with the tools and machines of others. Consequently, the matter of *wages* and *salaries* has come to be a paramount issue in the lives of most people, and they are thus interested in attempts to determine why wages are as they are and how they may be made higher.

From the employer's viewpoint, on the other hand, the significant fact is the productivity of the worker. If the employee produces a large output of work per hour, the employer can afford to pay him more than if his output per hour is small. A large output represents a low labor cost per piece. It may be cheaper to hire an expensive workman than an inexpensive workman, if the former is a more rapid or a more accurate operator. The product per man therefore is of prime significance, since the employer hires men only to secure a profit. The product per man, however, is merely another term for marginal productivity of labor. Thus we must consider marginal output if we are to establish principles governing the price for labor.

Marginal Output of Labor.—The behavior of marginal output was discussed in the treatment of factorial proportion in Chap. XIII. It is applicable to the wage problem in two respects. On the one hand, the marginal productivity of all labor is said to determine the share in the national income which goes to wages.

On the other hand, the marginal productivity of particular workmen determines the number of employees that will be hired by a given producer. These two applications will be discussed in turn. Since the employer is interested in the receipt of profits from the sale of the goods produced, the value productivity and not the physical productivity of the workman is the significant fact in this analysis.

Marginal Productivity Illustrated.—To simplify the treatment, assume that all labor is equally skilled, that perfectly free competition and mobility of labor exist, that only one kind of work is to be done, and that production obeys the law of less-than-proportional output (see Chap. XIII). The data in Table 47 are

TABLE 47.—ASSUMED MARGINAL VALUE PRODUCTIVITY OF LABOR; PERIOD, 1 YEAR

Combination	Workmen available	Total value produced	Marginal value productivity
<i>Q</i>	40,000,000	\$80,000,000,300	\$1,700
<i>R</i>	40,000,001	80,000,002,000	1,300
<i>S</i>	40,000,002	80,000,003,300	1,100
<i>T</i>	40,000,003	80,000,004,400	

purely illustrative. They are not based upon experiment but they will show the relationship involved. Suppose the population numbers 40,000,002 persons of working age. The addition of one man in combination *S* over the number in combination *R* increased the total value produced by \$1,300, which is the marginal value productivity of this man. Let us call him Mr. *S*. No employer can afford to pay more than \$1,300 per year for his services; this is the value of the work which has been produced with his assistance. On the other hand, Mr. *S* need not accept much less than \$1,300 per year from any employer, since others stand willing to pay him almost that amount. Therefore the compensation of Mr. *S*, the marginal employee, must be \$1,300 per annum.

We have assumed free competition in the labor market, however. Because of this fact, no one of the 40,000,002 workmen need accept less than \$1,300 per year, and none will succeed in obtaining much more than that sum since all are equally skilled. Suppose another workman, Mr. *X*, seeks a higher wage. Mr. *X*

is no better than Mr. *S*, and the marginal value productivity of one is equal to that of the other. Before Mr. *S* appeared on the scene, the marginal value productivity of a man was \$1,700 and Mr. *X* received this sum. With the addition of one more man—any man—however, the productivity was reduced by \$400. If Mr. *X* should decline to work for less, his employer would lose only \$1,300 and so can afford to pay no more than this amount. Under our assumed conditions, therefore, all employees receive the same wage, and that wage is determined by the marginal value productivity of labor. This productivity depends upon the state of the arts in the country, the natural resources available, the number of men who seek work, and the general price level.

Mathematical Statement of the Theory.—Let us assume that production can be expressed as a homogeneous equation of the first degree.¹ The production equation can be written in the following manner:

$$P = f(L, C, A, \dots, N)$$

where P = the total national product, and
 L, C, A, \dots, N = the factors of production.

If L equals the number of laborers, then the marginal productivity of labor is, by definition, dP/dL (rate of change in the total national product with respect to changes in the amount of labor, all other factors of production remaining constant). The total share of the national product going to labor is thus $dP/dL \cdot L$. The share going to any other factor of production may be similarly written. The distribution of the national product can now be expressed in the following manner:

$$P = \frac{dP}{dL} \cdot L + \frac{dP}{dC} \cdot C + \frac{dP}{dA} \cdot A + \dots + \frac{dP}{dN} \cdot N \quad (16)$$

In the above equation the sum of the products of marginal productivity times the number of units of each factor of production used equals the total national product. It is in this way that,

¹ A homogeneous equation of the first degree is one in which the sum of the exponents of the variables in each term is equal to one. This assumption is necessary to the above analysis in order to have the sum of the individual shares of the total product equal the total product.

theoretically, under certain assumptions, the distributive shares of the national product are determined.

The Effect of the Theory's Assumptions.—The first assumption, *i.e.*, all labor is equally skilled, is not essential to the validity of the theory. We may suppose that there are a number of different kinds of work to be done and a number of different degrees of skill which may be employed. The marginal value productivity of each degree of skill may be inserted in equation (16) and the compensation for each class of labor, and the share of that labor group in the national product, may be determined. To this extent the theory's assumptions may be made to approach more closely to the real facts of life.

The second assumption of perfectly free competition and mobility of labor, however, is more vital to the theory's validity. If we consider the actual situation instead, where competition is far from free in many trades, and where labor does not move readily from place to place unless the intervening distance is very short, we find that employees may receive less than the full marginal value productivity. Competition does not force employers to pay the full sum, for workmen do not know the wages and working conditions in various plants. Thus the price of labor may be lower than the amount industry could afford to pay. On the other hand, the ignorance of employers in regard to production costs may result in wages above the marginal productivity level. It is much less likely that wages will remain for long above this level than that they will be below it, however, for the former condition reduces business profits and may result in early bankruptcy. Hence businessmen will become aware of the condition and will take steps to change it. The ignorance or lack of bargaining strength of employees, on the other hand, may permit wages to remain below that level most of the time.

Bargaining Range for the Price of Labor.—Since the labor market is not subject to perfectly free competition, a bargaining range for wages is typical of most labor rates. In Fig. 39 the band *MM* represents the declining marginal productivity which follows an increase in the number of workmen when the various productivities cannot be plotted on a smoothed curve owing to the absence of free competition. If *OA* represents the number of workmen, the probability is 1 out of 2 that the marginal productivity will fall between *AE* and *AF*, and so the wage per man will appear

between OB and OC . If the workmen are in a strong bargaining position, it is likely that wages will be nearer OB , while if they are in a weak position the wage may be closer to OC .

The practical limits to this bargaining range are somewhat indefinite, perhaps, but they are significant, at least in the long-run determination of wages. The upper limit to the fluctuation of wage rates may be established by marginal value productivity. No employer can continue for long to pay his men more than they produce for him; otherwise his net profit would be curtailed and, if he is a marginal producer, he will suffer a loss. If labor unions are strongly organized they *may* succeed in obtaining the full

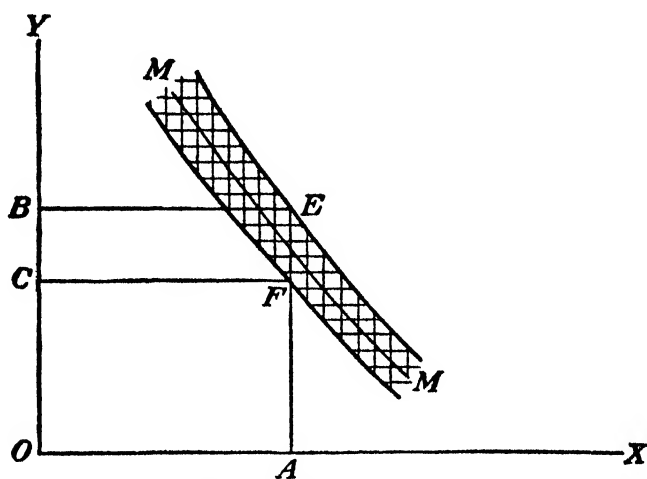


FIG. 39.—Bargaining range for wages based on marginal productivity.

marginal productivity wage most of the time, but unorganized labor groups often may receive something less than this amount.

The lower limit to the fluctuation of wage rates depends, to a considerable extent, upon the workers themselves. It is possible that wages may decline almost to zero but it is much more likely that the lower limit will be above this level. It may be a wage which barely keeps the workers alive, or it may be a wage which is high enough to provide a more satisfactory standard of living. We may note two possibilities in this connection.

Malthusianism and the Supply of Labor.—Thomas Robert Malthus, an English curate and economist, published an essay on population in 1798. Malthus argued that food and other means of subsistence for man could be increased but slowly under the most favorable conditions. Thus an arithmetical progression may be taken to represent the most rapid expansion of the food

supply which is possible, *i.e.*, 1, 2, 3, 4, 5, and 6. A geometrical progression, *i.e.*, 1, 2, 4, 8, 16, and 32, more closely represents the tendency of population itself to increase, for mankind has the reproductive power to double its numbers at least every 25 years. Therefore there is a marked tendency for mere numbers of men rapidly to outrun the food supply available for their maintenance. How is population restrained so that men are able to subsist?

Malthus noted two classes of restraints upon the tendency to expand too rapidly. One check upon population growth is "positive." Forces which increase the death rate keep the number of men within bounds; such forces are famine, pestilence, and war. In modern times we see these positive checks in operation in some provinces of China, for example. The other check upon population is "preventive," and includes the factors which reduce the birth rate. Chief among these today is birth control but, at the time when Malthus wrote, late marriage and "moral restraint" were more important.

Lower Wage Limits.—If the positive checks are more important, so many men may be seeking work that the marginal productivity of a man in terms of Table 47 is low. Indeed it may fall so low that the income from a year's work is barely enough to feed, clothe, and house the worker and his family. Lack of knowledge and imperfect competition may have the same effect. Thus the lower limit of the bargaining range may be bare subsistence. If the limit is lower the death rate rises, the working population is decreased, and scarcity raises wages to some degree. If the limit is higher the birth rate may rise, the population is increased, and wages may fall. This theory shut the door to hope and opportunity for the working classes and was responsible in no small measure for the name carried by economics for many years, *i.e.*, "the dismal science."

If the preventive checks are more important, however, as is the case today, numbers are held well within the limit of subsistence, and the door is opened to the attainment of relatively high standards of living on the part of labor. The smaller labor force has a higher marginal productivity and can command a higher wage or, in the event of imperfect competition, the force of man's desire to maintain a given standard of living leads him to refuse to work for less if any alternative is available. Thus the lower limit of the bargaining range today tends to be a standard-of-

living wage. Workmen resist vigorously any attempt to cut wages below the level which they feel essential to their standard. While this attitude cannot force wages above marginal productivity, it can and does prevent them from falling far below that level.

Productivity Applied to the Individual Plant.—In discussing the marginal output of labor, the point was made that marginal productivity is significant in two ways. One has been treated, namely, the determination of wage rates for the country as a whole when all workmen are considered in relation to the whole stock of natural resources upon which their efforts are applied. The second aspect of marginal productivity remains to be examined.

Assume now that wage rates have been determined for the country as a whole. Let us examine the case of a particular employer who wishes to determine the number of employees to be hired. If wages are low he should use more men than if wages are high, according to the analysis of costs given in Chap. XIII. The marginal productivity theory assumes that men will be added to the working force until the last man added just pays for himself. The point may be illustrated by the assumed data in Table 48. Wages are \$5 per day for this class of labor, and the employer finds that the total value output increases more and more slowly as he hires additional men. The fifty-first man adds \$7 to the producer's income and costs \$5 to hire; thus the

TABLE 48.—ASSUMED MARGINAL VALUE OUTPUTS; PERIOD, 1 DAY

Men hired	Cost per man per day	Total value output	Marginal value
50	\$5	\$10,520	
51	5	10,527	\$7
52	5	10,532	5
53	5	10,535	3

employer nets \$2 if he hires this man. The fifty-second man adds \$5 to the income and a like amount to cost; it will not pay to hire *more* than fifty-two men, and it may be better to use only fifty-one men. Most manufacturers are unable to figure costs so closely as this example requires, but the principle involved is applicable

to all cases: An employer will not hire men if they do not produce more value than they cost.

The Assumption of Less-than-proportional Output.—The third assumption of the theory of marginal value productivity is that production obeys the law of less-than-proportional output. The analysis of this problem in Chap. XIII suggested that some examples of production were characteristic of the stage of proportional output instead of the stage of less-than-proportional output, or were instances of constant output. The theory of marginal productivity can be applied only to the stage of less-than-proportional output. In other cases the marginal output is a constant or is zero. This difference in output behavior may prevent the application of the theory to the determination of the number of employees that will be hired in a given plant, but it does not affect the crux of the theory, namely, the determination of wage rates for the country as a whole. When the entire labor force is applied to the natural resources of the nation, the product obtained is a less-than-proportional one if the working force is sufficiently large. On this point there can be no dispute.

Relation of Wages to Value Product.—One significant relationship remains to be noted regarding the theory of marginal value productivity. The share of wages and salaries in the national income was shown to be about 66 percent. Therefore two-thirds of the market for the goods produced in the nation is to be found in the workers who produced them. The amount that these persons are able and willing to pay for commodities and services determines to a large extent the price at which goods will sell. But the prices at which they sell are an important factor in the value productivity of labor. This productivity in turn determines the percentage of the output which labor can buy. Thus we have mutual relationships all around this circle. Prices depend upon purchasing power, which is due in part to prices.

All prices are interdependent, as we have pointed out in previous chapters. If it were not for the tremendous complexity involved, all prices might well be analyzed by means of simultaneous equations, where a separate equation is set up for the price of each commodity, each service, and each factor of production in industry and trade. This method of analysis has been suggested by a number of economists and theoretically has much

to recommend it. However, the complexity of a complete analysis of this type is too great for the purpose to be served by this text.

Variations in Money Wages.—Wages are subject to many variations. They are higher at some times than at others; higher in some countries than in others; higher for certain types of work than for other types; sometimes higher for men than for women; sometimes higher for married men than for single men. Money wages may go up while real wages are going down owing to a shrinkage of purchasing power. Hourly wages may be high but the number of hours worked per week may be low; relatively low monthly wages, if continuous, may result in larger annual earnings than would be obtained with high seasonal wages.

A few wage variations will illustrate some of these differences. In October, 1937, the union hourly rate for bricklayers in Chicago was \$1.50; in Los Angeles, \$1.25; in New Orleans, \$1; in Paris, France, 42 cents. At the same time bus drivers in Chicago received 77 cents; in Denver, 61 cents; in New York, 70 cents. Common labor in 1932 received hourly rates of 19 cents in the South; 36 cents in New England; 44 cents in the mountain states; and 48 cents in the Pacific Coast states. Roughers in sheet mills were paid 56 cents in 1910; \$1.58 in 1920; \$1.15 in 1924; \$1.07 in 1929; and 74 cents in 1933. These wage variations show clearly that there is no one wage for all workers nor one level of wages for all times.

Causes of Wage Variations.—These variations in wages may be due to a number of causes. There is a tendency for wages to follow changes in commodity prices. If the prices of commodities rise, wages also tend to rise but they move upward more slowly. Wages also tend to lag behind other prices when the latter fall. Thus changes in *value* productivity may result in changes in wages.

There is a tendency for wages to vary between industries, in part, at least, because of differences in a man's value output in different lines of work. Competition *tends* to equalize opportunities in various lines of work, but the relative immobility of labor and other factors permit differences in value productivity to continue for some time. The greatest differences in productivity usually are to be found between countries as, for example, between India and the United States.

Wage variations between cities, and between countries, may be due to differences in *money* wages or to differences in *real* wages. Thus painters may receive higher money wages in New York City than in Atlanta because of higher living costs or the more seasonal nature of painting in one city than in the other. Perhaps *real* annual wages are much the same; thus the cost of living and the number of days worked per year must be considered in any wage comparison.

Incentive Wage Plans.—Wage and salary earners find themselves in the midst of a constantly growing drive for more and still more efficiency. Some employers have attempted to allay friction and to promote industrial good will by sharing profits and encouraging copartnership in industry. Many industrial engineers, on the other hand, have bent their efforts toward increasing production, on the assumption that industrial troubles are not due so much to a faulty division of the product as they are due to the smallness of the product itself.

These efficiency drives have all been introduced with the cost-reduction idea in mind. Indeed, scientific management in all its phases has been sold to employers largely on the ground that it would increase profits by reducing costs. A very important part in this program of cost reduction was the development of a great variety of incentive wage-payment plans. The incentive wage idea has been used most extensively in the automobile, rubber, and electrical products industries.

Hourly wages are defective because they pay a worker for his time rather than his work. Straight piece rates became the first substitute for hourly wages, and a worker was paid according to what he produced. Many piece-rate systems defeated their purpose because they were introduced without a thorough job analysis. If workers earned a wage which seemed too high for the general labor market, rates arbitrarily were reduced, with resulting dissatisfaction and curtailment of output.

Beginning with Frederick W. Taylor in 1885, a notable list of engineers appeared who devoted much time to devising new methods of wage payments. A few of these wage incentive systems are indicated in Fig. 40.

Incentive Wage Plans Only Partly Scientific.—Because all incentive plans relate wages to productivity, many persons believe that they will solve the wage problem. They think that wages

determined under systems of this sort are fair, not only as between workers, but also as between workers and employers. Nothing could be farther from the truth. They may be fair or they may be unfair. That depends not only upon the method employed for rewarding efficiency but also, and this point is of even greater

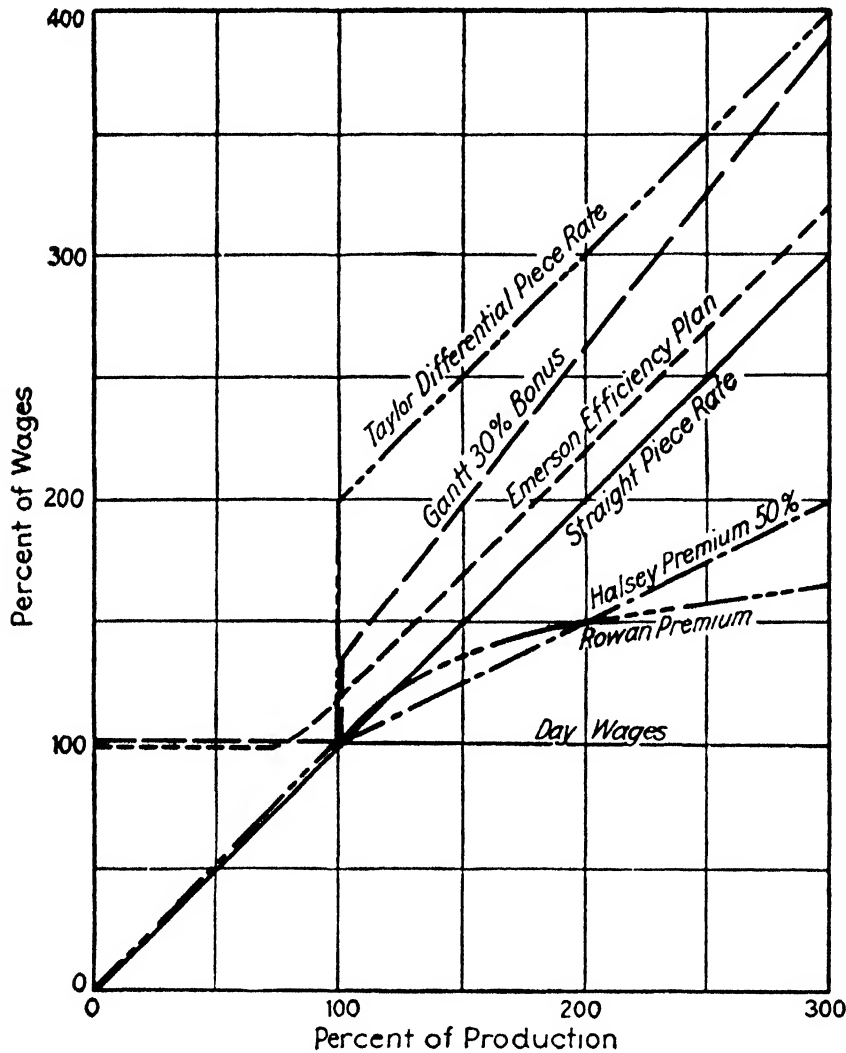


FIG. 40.—Chart of incentive wage plans.¹

significance, upon the method used to determine the base rate. No matter how carefully this rate is established, the real problem of fairness between employers and employees cannot be solved in this arbitrary fashion.

Despite their defects, incentive wage plans have many advantages. They add to production, in some cases doubling and

¹ WISSLER, WILLIS, "Business Administration," McGraw-Hill Book Company, Inc., 1930, p. 391.

trebling it. Once the base wage is accepted, they guarantee *relative* fairness between workers in any given company. The larger the output, the larger will be the total product to be divided, and there is evidence that many incentive plans add considerably to the worker's earnings. Sometimes the incentive plans result in "driving" which is detrimental to the health of the workers, but this also may occur under hourly wages. However much the proponents of scientific management may have added to the total volume of production, however, they have furnished little, if anything, to the economic analysis of wage determination.

A "Production-maintenance Wage."¹—The question of wage determination is not merely a matter of business mechanics or justice for the parties concerned. It is a problem of national efficiency. The opinion is growing among enlightened manufacturers and employers that continued maximum production is possible only when the requisite amount of the national income is paid as wages and salaries. Wages and salaries ring cash registers. A few business leaders, therefore, are turning to the *production-maintenance wage* as a new wage *ideal* which, through enhanced consumer purchasing power, will permit them to retain and broaden their markets. Unfortunately, however, there is still a strong belief in some quarters that wages must be deflated periodically. While this attitude prevails, a wage level designed to maintain producers' markets cannot secure widespread acceptance.

Growth in Production per Worker.—From 1899 to 1925 the physical volume of production of farms, factories, mines, and railroads in the United States increased by 136 percent, while population grew slightly over 50 percent.² Thus production per capita increased about 60 percent in the final quarter of the nineteenth century. However, the volume of output for each worker engaged directly in production increased 76 percent.

Significant changes in the productivity of labor in manufacturing industries took place during the recovery period, 1933–1935. The average output per man-hour increased 20 percent

¹ This term has been suggested by Dr. C. A. Dice, professor of banking, Ohio State University.

² "Recent Economic Changes," McGraw-Hill Book Company, Inc., 1929, Vol. II, p. 451.

from the February-March period of 1933 to the June-July period of 1933. The partial paralysis of business in the early part of 1933 and the stimulus which came a little later through the NRA largely account for this change in output. By December, 1934, the ranks of employment had been diluted by less efficient workers with a resulting decline in productivity per wage earner and per man-hour. As business improved in 1935, 1936, and the first part of 1937, man-hour productivity in certain plants continued to increase, but in other plants the dilution of the labor force by less efficient workers resulted in a reduction in man-hour productivity.¹

Several factors are responsible for the increased productivity of recent times. Thus the proper adjustment of population to natural resources, in view of the technical knowledge available, is significant. The ability of technicians to devise new methods, processes, and equipment, and of business managers to organize industry so that these discoveries may best be put into practice, determines the productivity of the population. Finally, the ability of the public to buy the goods that have been produced is essential. If all markets together will not absorb all the productive efforts of the nation, and if people still have unsatisfied wants, the economic system fails to fulfill its duty and productivity is not up to the mark it should reach.

That part of the increase in productivity which is due to any one factor cannot be determined accurately, but engineers unquestionably are making a heavy contribution. The late Thorstein Veblen summed up the situation by saying:

These expert men, technologists, engineers, or whatever name may best suit them, make up the indispensable general staff of the Industrial System; and without their immediate and unremitting guidance and correction the industrial equipment will foot up to just so much junk.²

The Engineer's Share.—The importance of engineering raises the question as to why all engineers and scientists do not receive higher salaries. Of course, some engineers do receive large incomes. Other engineers, like Chrysler and Edison, combined business management with their engineering activities. Although engineering contributions are important, the services of any one

¹ National Bureau of Economic Research, *Bulletin* 56, May 10, 1935.

² "The Engineers and the Price System," B. W. Huebsch, 1921, p. 69.

engineer may not be very significant to society because some other engineer stands ready to take over the job. Engineering in its elementary stages tends to become a standardized process; the basic knowledge of one engineer is the knowledge of all. Standardized services, like standardized commodities, face persistent competition. Individual engineers can hope to escape the leveling effects of this competition only by changing somewhat the basis of their training. If they prepare themselves for administrative positions as well as for technical jobs, they may escape some of the competition which the technically trained men have to face.

Engineers, like teachers, bargain as individuals rather than as groups. In terms of supply and demand, individual bargaining means that engineers lack the ability to control the price of the thing they have to sell, *i.e.*, engineering services. Whether American engineers ever will combine to sell their labor at definite rates remains to be seen. Veblen thought they might:

It should by no means come as a surprise if the engineers are provoked to put their heads together and disallow that large absentee ownership that goes to make the vested interests. . . . There stand behind them the massed and roughhanded legions of the industrial rank and file, ill at ease and looking for new things. The older commercialized generation among them would, of course, ask themselves: Why should we worry? What do we stand to gain? But the younger generation, not so hard bitten by commercial experience, will be quite as likely to ask themselves: What do we stand to lose?¹

The Trend of Real Wages.—*Real* wages, the purchasing power of money wages, may increase either because of an increase in productivity or because workers may obtain a larger proportion of the total product. An increase in productivity, however, does not always lead to greater real wages. Real wages in ten important industries of the United States, for example, were 29.6 percent less in 1918 than in the period from 1890 to 1899. During most of this period physical production was increasing about 2 percent per year. Since the close of the war the situation has changed. The average real wages of some 14 million workers in 1926 were 30 percent higher than those of 1914 and

¹ *Ibid.*, p. 81.

38 percent higher than those in the 90's.¹ Real wages continued to rise until the 1930 depression, and since that time have followed in the main the trend of business activity.

Problems

116. Would it be possible, through trade union action and government regulation, to force wages to such a high level that the nation would be unable to compete with other countries in world markets because of high production costs? Explain carefully.

117. In a large American copper company wages by contract fluctuate with the price of copper. What are the advantages and disadvantages of this plan to the employees of the copper company? Would you recommend this plan for the automobile industry? Explain.

118. Workers of a given type in city *X* receive \$4 a day and are employed 300 days in the year. Food for a family of four costs \$40 per month; housing, \$30; clothing \$15; and miscellaneous items, \$10. Workers of a similar type in city *Y* receive \$6 a day and are employed 250 days in each year. Food costs \$55 per month; housing, \$40; clothing, \$20; and miscellaneous items, \$10. Which group of workers has the higher real income? Should factors other than those cited be taken into account? Why?

119. "Under incentive wage plans, wages cannot be explained by the marginal productivity theory. According to this theory no worker will be paid more than the amount received by the least efficient worker, whereas the purpose of incentive wage plans is to pay each worker according to his relative efficiency." Is this true? Explain.

120. Prof. Taussig has pointed out the fact that employers pay wages in advance of the sale of the finished products. The wage advance is thus an investment on which an interest charge must be made. Hence the marginal value productivity must be *discounted* if the true productivity of the workman is to be found. Is this analysis sound? If not, why? If so, does it alter the conclusions reached in this chapter? Why?

121. "The marginal productivity theory does not explain why wages are what they are. The theory merely attempts to show how much labor will be supplied *at a given wage*. Thus the theory merely begs the question, because it does not explain how the existing wage was determined." Is this a fair criticism? Why, or why not?

122. Suppose you were hiring workers to manufacture a new article. How would you determine their wages? According to your proposed method, which of the following is of most importance: productivity, supply and demand, or some other item? Why? Can you frame a law of wages that will be true as universally as the law of gravitational attraction? Why?

References

CLARK, J. B.: "Essentials of Economic Theory," The Macmillan Company, 1924.

¹ DOUGLAS, PAUL H., "Real Wages in the United States," Pollak Foundation for Economic Research, 1930.

DOUGLAS, PAUL H.: "Real Wages in the United States," Pollak Foundation for Economic Research, 1930.

———: "The Theory of Wages," The Macmillan Company, 1934.

International Labour Office: "Year-Book of Labor Statistics, 1937," Geneva, Switzerland.

KIEKHOFFER, WILLIAM H.: "Economic Principles, Problems and Policies," D. Appleton-Century Company, Inc., 1936.

United States Bureau of Labor Statistics: *Monthly Labor Review*; *Labor Information Bulletin*, special studies and reports.

United States Department of Commerce: "National Income in the United States, 1929-1935."

———: "National Income, 1929-1936."

CHAPTER XVIII

THE PRICES OF CAPITAL, LAND, AND MANAGEMENT

Production today is the result not only of the efforts of labor, but also of the services rendered by land, capital, and management. Indeed, one of the outstanding characteristics of men, as distinct from other forms of life, has been their use of objects devised to assist them in attempts to utilize the resources of nature. In Chap. XVII the price paid for labor was discussed as a distributive share in the national income. In this chapter the prices paid for the remaining factors of production are to be examined from the same viewpoint in order to complete the treatment of the principles of distribution.

I. THE PRICE PAID FOR THE USE OF CAPITAL

Capital Equipment.—In the discussion of terminology in Chap. II, a distinction was drawn between *capital equipment*—the buildings, machinery, and tools used in producing consumption goods—and the *value* of this equipment expressed in dollars. This distinction is important, for the equipment is productive in the sense that its use increases the productivity of human labor, but the money used to express its value usually is not itself productive. Thus it is the equipment and not the money value with which we shall be concerned.

The use of capital equipment of all kinds indicates a marked degree of “indirectness” in production. This process of “roundabout production,” as the celebrated Austrian economist, Böhm-Bawerk called it, is an outstanding characteristic of economic life. Thus to build a house men first must have available the necessary machinery and tools, such as logging apparatus, sawmill equipment, transportation devices, and carpenters’ tools—to mention only a few examples—before they can secure the house which, after all, was what they really wanted. Similarly all industrial equipment is part of a roundabout process which

culminates in the end products that are themselves to be consumed by individuals.

Roundabout production in the long run implies *saving*. Some one must have used less consumption goods than he helped to produce in order that the surplus, in the form of savings, would allow workers to live while constructing the capital equipment which is the essence of the system of roundabout production. Savings do not result always in the production of additional capital equipment, nor are all our capital facilities normally in use, but capital could not be accumulated if production were carried on only for immediate consumption needs alone and in the absence of any saving.

Interest.—While the capital goods themselves commonly are owned by the producer who uses them, the purchasing power by means of which he acquired title to the equipment often is borrowed from others. Thus interest is the price paid for the use of borrowed purchasing power or, as the businessman says, it is the price paid for money. The economist, desirous of emphasizing the fact that the ultimate goal is not money but goods and services, defines interest as the price paid for the use of capital. From the lender's viewpoint, interest is the distributive share which goes to the capitalists who undertake the necessary function of saving.

Capital may be either *fixed* or *circulating*. Railroads, power plants, equipment, and buildings are fixed capital. Electric motors under construction, flour in warehouses, and clothing on dealers' shelves are examples of circulating capital. There is no distinct line of division between the two classifications; it is the use to which the capital is put that determines how it should be classified.

Funds for fixed capital usually are obtained from the sale of bonds, stocks, long-term notes, and mortgages. Loans for circulating capital sometimes are secured from commercial banks. In any case, the thing paid for is purchasing power, and the annual price is expressed as a percentage rate on the principal of the loan for a period of one year.

Capital Value a Derived Value.—The value of capital goods, like the value of labor, is derived from the value of the consumption goods produced therewith. If a machine will not produce something which sooner or later can be sold in the commodity

markets at a profit, the machine is valueless. No one would pay for such a piece of equipment, nor would anyone borrow money and agree to pay interest in order to buy such a machine. The price paid for capital, therefore, is derived from the ways in which the funds can be used profitably to purchase equipment the value of which depends upon the value of the end products which can be sold in the market.

The Productivity of Capital.—Capital equipment is productive only because it adds to the quantity, and thus usually to the value, of the goods that would have been produced by direct labor alone. Men may expend their efforts to obtain handmade goods, but they find in most cases that efforts spent to produce machines and tools result in a much larger output of final consumers' goods than could be obtained by hand processes. A portion of this increased return may be claimed by the capitalist who provided the funds for the machines and tools, but if he seeks all of it the manufacturer will not use capital equipment. Therefore the manufacturer himself must be permitted to retain part of the increased return which results when capital equipment reduces the time and effort required in production, for otherwise it would not pay him to utilize these roundabout methods.

Marginal Value Productivity of Capital.—The treatment of production in Chap. XIII indicated that the fixed- and variable-input factors in an example of less-than-proportional output could be reversed. Thus we may consider an example in which the equipment used is the variable factor while men and other resources are held constant. In this case the marginal output will be with reference to capital goods. If all the labor force and natural resources of the nation are considered to be the fixed-input factor, and the available amounts of capital goods repre-

TABLE 49. --ASSUMED MARGINAL VALUE PRODUCTIVITY OF CAPITAL GOODS;
PERIOD, 1 YEAR

Combination	Value of capital' goods available	Total value produced	Marginal value productivity
W	\$200,000,000,000	\$80,000,000,000	
X	200,000,001,000	80,000,000,080	\$80
Y	200,000,002,000	80,000,000,150	70
Z	200,000,003,000	80,000,000,210	60

sent the variable-input factor, the marginal value productivity of equipment may be determined. Thus in Table 49, assumed data show that the marginal value productivity of capital goods to the value of \$200,000,003,000 is \$60. When this productivity is related to the "dose" of capital goods, \$1,000, the interest rate becomes 6 percent per year. Hence the total interest charge per year for the nation's capital would be \$12,000,000,180.

The mathematical statement of the marginal productivity of capital would run in terms similar to those given for labor in Chap. XVII. Thus if C represents the nation's capital, and P the total national product created, the marginal productivity of capital would be dP/dC , and the share of the national product which goes to capitalists would be $dP/dC \cdot C$. Therefore a second set of variables in equation (16) may be determined (see p. 348).

Assumptions of the Theory.—The theory of interest determination on the basis of marginal productivity assumes that a single rate of interest applies to all uses of capital. Capital actually takes many forms and there are a number of interest rates. Thus Table 50 presents estimates of the various forms of capital supply

TABLE 50.—ESTIMATED CAPITAL SUPPLY IN THE UNITED STATES IN 1929*
(000,000 omitted)

Item	Capital supply
Agriculture	\$ 16,800
Mineral industries.	6,000
Business buildings.	25,000
Non-farm residences	5,000
Manufacturing.	53,000
Trade and commerce.	10,000
Transportation.	37,700
Public utilities.	21,200
Tax-exempt properties	22,600
Navy.	1,500
Gold and silver.	5,200
Net foreign investments	10,000
Total.	\$214,000

* "The Formation of Capital," Brookings Institution, 1935, p. 187.

in the United States. Five of these items are durable consumption goods rather than capital goods in so far as domestic production is concerned. Non-farm residences, tax-exempt properties, the navy, gold and silver, and net foreign investments might well be deducted from the total there given. The amount remaining,

\$169,700,000,000, may be taken to represent the capital value of domestic industry.

Interest rates for various classes of loans vary from time to time and from place to place. The average annual rates charged customers by commercial banks in New York City varied from 5.74 in 1929 to 2.36 in 1936.¹ The similar rates charged by banks in eight other northern and eastern cities ranged from 6.04 percent in 1929 to 3.30 percent in 1938, and in twenty-seven southern and western cities, from 6.14 percent in 1929 to 4.10 percent in

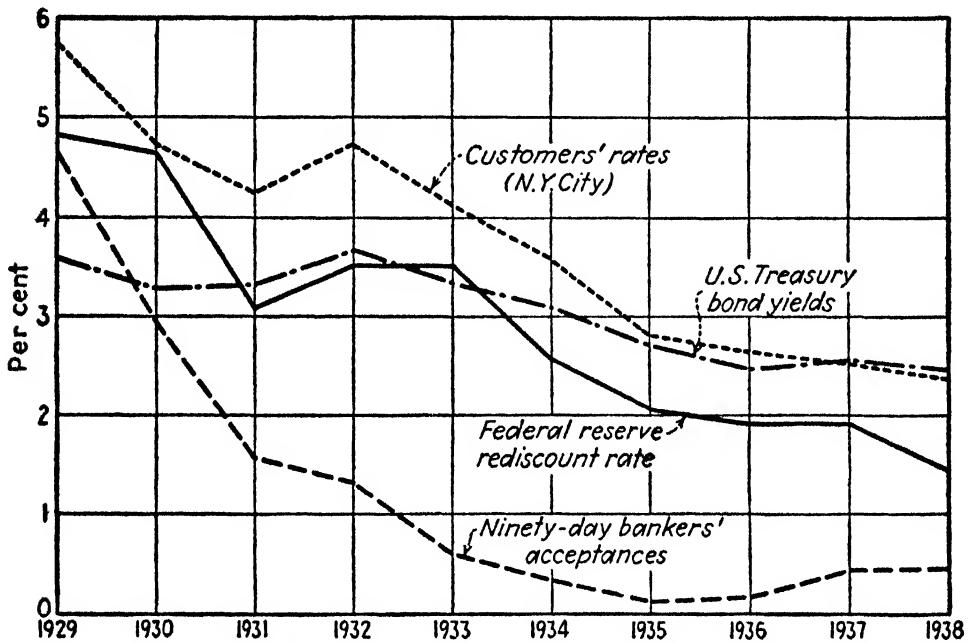


FIG. 41.—Annual average money rates and U. S. Treasury bond yields, 1929–1938.²

1938. Generally speaking, the West pays higher interest rates than does the East, and rates are higher in prosperity than in depression. The variation of other rates is indicated in Fig. 41.

The different rates that apply to the various uses of capital may be treated separately. The marginal value productivities of these uses may be inserted in equation (16) as a series of distributive shares going to owners of capital as determined in the different money markets. Thus the equations for three money markets might be written as follows:

¹ This and following rates for 1938 are based upon a three months' average.

² "Statistical Abstract of the United States," 1937; *Federal Reserve Bulletin*, April, 1938.

$$\frac{dP}{dC_1} \cdot C_1 + \frac{dP}{dC_2} \cdot C_2 + \frac{dP}{dC_3} \cdot C_3 \quad (17)$$

Full Utilization.—The productivity theory, in the second place, assumes that all the factors of production are fully utilized. Thus unemployed labor, idle factories, or hoarded funds would destroy the conclusions reached on the basis of this theoretical analysis. The failure fully to utilize the factors of production may be due largely to the absence of the free competition to be discussed in the next paragraph as the third assumption, or it may be due to “frictions” which prevent prompt adjustment of supply to demand. In any event, the lack of full utilization, often typical of the modern economic system, prevents the exact application of the theory as a tool of analysis to be used for the determination of interest as a share in the national income.

The Bargaining Range for Loan Funds.—In the third place, the marginal value productivity theory assumes the free play of competition and the mobility of capital. This assumption is more applicable to the price of capital than to the price of labor. While some money markets are more or less distinct from others, some degree of interrelationship may be found among the various interest rates and the various money markets. Competition in the capital markets is relatively free.

Purchasing power is highly mobile, but the capital goods in which it is invested often are not mobile at all. Loan funds not only move readily from one market to another in the United States, but also move rather freely across international boundaries in the absence of programs of capital control. This interrelationship is so close, indeed, that attempts to control rates in one country alone may be ineffective owing to the repercussions of control activities in other money markets.

When funds have once been invested in equipment, however, the situation is quite different. Some classes of equipment are useful in many lines of business but the applicability of others is restricted narrowly. A producer who must change his field of work, or who wishes to retire from production, may dispose of a standard lathe much more readily than a railway may dispose of its right-of-way. When investment has once been undertaken, then the producer may consider capital as relatively immobile. In this event, capital may be forced to operate at a level of com-

pensation much below its former marginal productivity. Therefore a bargaining range for loan funds may exist, and interest rates may fluctuate between limits which are more or less widely separated.

Economic Theories of Interest.—Limits to the bargaining range for loan funds may be explained in terms of various economic theories of interest. The foregoing discussion has been based upon the *productivity theory* of interest, which may be taken to explain the upper limit to interest rate fluctuations. A producer will not undertake to borrow additional funds if the interest charge involved is greater than the marginal value productivity of the capital goods he can purchase therewith. The extent to which producers demand loan funds, therefore, depends upon the *net* productivity which the use of the funds makes possible.

Interest rates usually do not fall to zero, because of a lower limit to the bargaining range. Funds will not be offered in large amounts by capitalists if rates fall too low. The *abstinence theory* and the *undervaluation-of-the-future* theory attempt to explain this lower limit. Since a given fund of purchasing power cannot be used in two different ways at the same time, the capitalist must choose whether he will spend his funds for the immediate satisfaction of his own wants (the purchase of consumption goods) or whether he will lend them to someone else in return for the income which he will receive (loan for interest; funds then may be spent by others for capital goods). The decision to "invest" necessitates the *abstinence* from present satisfactions. The capitalist, says the abstinence theory, will not thus abstain unless he is paid interest to do so. If the supply of funds is insufficient, the rate offered by borrowers may be raised to encourage greater abstinence.

The undervaluation-of-the-future theory approaches the problem from a slightly different angle. Men prefer enjoyments in the present to those in the future. Life is uncertain, and future pleasures appeal abstractly to the mind rather than directly to the senses. Whatever the reason, a dollar a year hence is worth less than a dollar now. Interest corrects the difference between present and future values. If the interest rate is too low, the correction is insufficient, and present satisfactions (consumption goods) are more fully utilized; if borrowers bid up the rate, present

enjoyments will be satisfied less fully and the volume of loan funds will increase.

Criticism of Interest Theories.—The productivity theory may be criticized on two grounds, of which one is the fact that it may be impossible to determine the actual marginal productivity in real life. This criticism, applied both to labor and to capital, is answered most easily by mention of the fact that marginal productivities *are* determined in the market place every day in some fashion. The determination, while undoubtedly imperfect, seems accurate enough for most practical purposes, for business conduct is predicated upon these marginal determinations.

The second criticism emphasizes the fact that many loans are not for productive purposes. Marginal value productivity sometimes is said to have no place in a consumption loan and thus to have no effect upon its interest rate. The interest rate on a business loan, however, is an opportunity cost to a creditor who otherwise might have offered a lower rate on the consumption loan. Furthermore, many consumption loans indirectly finance production since they permit an expansion of the market for goods. Thus such loans may be related to marginal value productivity after all.

The Supply of Capital.—The criticism leveled against the abstinence theory is based upon the sources of supply of capital. A portion of capital supply results from individual savings, but some persons save in order to accumulate a definite sum for a given purpose. If a man wishes to acquire \$100,000 on which to retire and live for the remainder of his life, the accumulation will occur most rapidly with a high interest rate. Thus he needs to put aside less per year than if rates are low, and so the amount of his saving is *inversely* related to the rate. Other persons receive such large incomes that they find it impossible to spend the whole amount on consumption goods; a portion is saved *in spite* of the height of interest rates. Capital accumulation for these two groups, then, is not related directly to interest rates. The third group saves more if rates are high than if they are low; for these persons only is abstinence directly related to the interest rate which they can obtain.

Corporate savings, perhaps, are more responsible for capital accumulation than are individual savings and may amount to a considerable sum in prosperous years; but these savings are made,

not so much with reference to a rate of interest as to provide a reserve with which emergencies in the future may be met. Such capital accumulation is called "involuntary saving" since many stockholders may not wish the corporation to save at all but may prefer that earnings be paid out immediately as dividends. They are required to save by action of the board of directors, whether they wish to do so or not; abstinence has occurred, but not with reference to a rate of interest.

The third source of capital accumulation is found in the banking system. Much of the short-term purchasing power used in industry is the result of discounts and other credit operations on the part of banks. The funds provided in this way are more important, perhaps, than those from either of the other types of saving. This capital accumulation is responsive to general business conditions as well as to interest rates; is it also the result of abstinence? We may answer in the affirmative, but with the proviso that the saving is not voluntary. Indeed, this saving is sometimes called "forced saving." If the credit granted by the banks is an addition to the money stock of the country it may raise the general level of prices if it comes in advance of an expansion of production. The rise in prices would force many persons to curtail consumption expenditures if their incomes did not increase concurrently. Thus consumption may be retarded and a larger proportion of the country's economic activity may be freed from supplying finished goods in order to provide capital equipment instead. "Saving" therefore has occurred but it has been forced upon that portion of the population that can least afford it, namely, those in the lower income brackets, and the abstinence is not related directly to a rate of interest.¹

Relation of Interest Rates to the Normal Length of Life.—Gustav Cassel, a noted Swedish economist, has suggested that the *normal length of life* is one of the factors which limits the bargaining range for loan funds. The general level of interest rates according to Cassel's analysis, roughly is inversely proportional to the average expectancy of life. Thus if men lived on the average about 50 months instead of 50 years, the interest rate might

¹ The relation between the interest rate and the supply of funds is discussed in a thought-provoking manner by A. B. Wolfe, *Savers' Surplus and the Interest Rate*, *Quarterly Journal of Economics*, Vol. 35, November, 1920, pp. 1-35.

be 60 percent a year instead of 5 percent, while if men lived about 200 years instead of 50, the rate might be $1\frac{1}{2}$ percent. Interest rates, in other words, must be high enough to make possible the accumulation of a competence during the normal life expectancy of men, so that the longer a man may expect to live, the lower will be the rate which permits him to make this accumulation.

Interest as a Cost of Production.—The interest charge on fixed capital is a fixed expense for the producer. Therefore this cost does not affect the *point* of most profitable operation, when the investment has once been made, as was shown in Chap. XIII. The cost of interest on the investment is an important factor in determining the *amount* of profits received, however, for excessive fixed charges consume a large share of the income which otherwise could be appropriated by the owners of the business.

The interest charge on circulating capital in part may be a fixed charge to the extent that a certain amount of such capital is necessary at all times if production is to continue, but a portion of circulating capital is responsive to changes in the volume of business done. Thus the interest payments for the use of capital which varies in this fashion are variable expenses and affect the point of maximum profit, which in turn determines the quantity of capital the producer will attempt to use.

Interest Rates in Installment Buying.—A wide range of consumption goods is purchased today upon the installment basis. Since commodities bought "on time" involve extra accounting, interest, and repossession costs, the prices paid by consumers often are higher than those charged when the same articles are purchased for cash. The burden of credit extension may be carried by the merchant himself, but usually he obtains financial aid from his bank or from an installment credit institution of some sort.

From the consumer's viewpoint it pays to buy for cash rather than to purchase on a partial-payment plan. A simple illustration will serve to clarify this point. Let P equal the cash price of the article, R the installment price, D the down payment, N the number of months during which partial payments are to be made, and i the interest rate. The cost of the credit extended therefore is $R - P$, and the total amount of credit extended is $R - D$. The debt is extinguished in a series of equal monthly payments, however, so the amount of credit extended for N months

is not $R - D$, but rather $\frac{R - D}{2}$ approximately, since each payment reduces the amount of the debt remaining unpaid. This "averaging factor" should not be used if N is much greater than 12, since compound interest then should be taken into consideration, but when N is less than 12 we may use this simple method with sufficient accuracy. Finally, the monthly payment method must be converted to an annual basis for interest rate quotations by use of the factor $12/N$. Therefore the formula for the installment rate of interest becomes:

$$i = \frac{12}{N} \cdot \frac{R - P}{\left(\frac{R - D}{2}\right)} \cdot 100 \quad (18)$$

Suppose an article sells for \$100 cash or \$115 on credit; the down payment is \$40; and the balance must be paid in 5 months. What is the rate of interest? Substituting in equation (18) we have:

$$i = \frac{12}{5} \cdot \frac{15}{37.5} \cdot 100 = 96 \text{ percent}$$

Installment rates for some commodities are in the neighborhood of 60 percent and charges of 30 percent or more are very common indeed. These high rates do not mean that the merchant is acting as a profiteer, however, for the cost of doing business on a credit basis is much greater than on a cash basis. Thus a book publisher offered a given book at \$5.95 cash or \$6.25 on credit with a down payment of \$1.25 and 2 months to pay the balance. Equation (18) shows the installment interest rate to be 72 percent, which seems high to say the least, but note that the cost of credit was only 30 cents. This sum must cover bookkeeping and mailing expenses in attempts to collect the balance due, as well as interest on the funds tied up in the credit extension and losses from bad debts. The publisher in this instance may have made a larger net profit on the cash sales than on the credit sales of the book.

Interest and Sinking Funds.—Sinking funds are accumulations of funds at interest to meet a specific need at some time in the future. For example, a company may have an issue of bonds which must be redeemed in 1958. By setting aside each year a

certain sum of money, an amount will be available, with the help of compound interest, sufficient to redeem the bonds on the specified date.

The amount of the annual payment to the sinking fund depends upon the principal sum to be accumulated, the number of years available for accumulation, and the interest rate. Thus the sinking fund is an annuity: A series of payments, usually equal in amount, which occur at equal intervals of time. The amount of an annuity of payments of \$1 per year accumulated for n years at i rate of interest is found from the formula

$$S_{\overline{n}|i} = \frac{(1+i)^n - 1}{i}, \quad (19)$$

and the amount of the annual payment R necessary to extinguish a given debt X in n years at i interest rate may be obtained from the equation

$$R = \frac{X}{S_{\overline{n}|i}} \text{ at } i \text{ percent.} \quad (20)$$

Thus if a \$1,000,000 bond issue is to be redeemed in 20 years and the accumulation interest rate is 5 percent, the annual payments to the sinking fund must be $R = \$1,000,000/S_{\overline{20}|5\%}$ at 5 percent = \$33,065.95. If the interest payments on the bonds also are to be cared for by the sinking fund, the annual interest charge must be added to the value of R . Investment tables give values for $S_{\overline{n}|i}$ in convenient form.

II. THE RENT OF LAND

Land.—The site factor has several characteristics which are the peculiar property of the surface of the earth. One group of characteristics is physical, the other economic. *Immobility* is an outstanding physical characteristic. Land, practically speaking, cannot be moved from one location to another, although transportation developments may affect its *relative* location. In the same way, many capital improvements upon land when once made cannot readily be moved to other places. Thus there is an Australian copper town completely equipped with improvements which have lost all value because neither the town nor the improvements could be moved when the supply of copper ore was exhausted and the town was abandoned. Other physical

characteristics are *durability* and differences in *fertility* and *location*. Finally, land universally seems to be subject to less-than-proportional output when its utilization has been carried beyond a fairly moderate degree of intensity.

The economic characteristics are *scarcity* and *sluggish adjustment* to economic forces. Land scarcity must be interpreted always in terms of uses. There is plenty of room for urban development in the plains area east of the Rocky Mountains, but this supply does not affect the demand for property in New York City. Thus it is scarcity of land for particular uses in a given location that is significant. When price changes make new uses of land advisable, the change to the new utilization often is a sluggish one. A fall in farm income does not result in an immediate abandonment of submarginal farms. Thus the adjustment of agricultural production to demand is a time-consuming process.

Land Utilization.—The total land area of the United States is 1,903,000,000 acres, of which improved farm land comprises about 26.4 percent; forest and cutover land 24.4 percent; unimproved pasture and range land 45.3 percent; and non-agricultural land 3.9 percent. Of the last-named area, 10,000,000 acres are included within the boundaries of cities and villages. Thus one-half of 1 percent of the area contains 75 percent of the population.

Department of Agriculture studies indicate that our land could be utilized much more intensively. On the basis of these estimates, improved farm land could comprise 42 percent of the whole area, an increase of 60 percent; forest land 18.7; unimproved pasture 34.6; and non-farm land 4.7 percent. The prices of farm and forest products would have to be quite different from those existing today, however, before such an ideal utilization could be a profitable one. The growth of population and other factors may establish such prices at some future time; today this ideal use is quite out of the question.

Rent.—Rent may be regarded as the distributive share that goes to the landowner. Rent also may be considered as the price paid for the use of the site factor in production. In either case, rent may involve two kinds of payments. Therefore we must distinguish between *contract rent*, the actual payment from tenant to owner, and *economic rent*. The former usually is larger since it

includes interest payments for the capital goods which may have been leased with the land. Economic rent thus comprises payments for the land area alone. A distinction also may be drawn between improvements *to* land and improvements *on* land. The former increase land values and economic rentals, while the latter increase building values and contract rents. The improvements *to* land may be illustrated by drainage, grading, and other applications of capital which become bound up inseparably with the land itself; those *on* land may take the form of buildings, railway spurs, and other movable structures.

The Productivity of Land.—The productivity of land depends upon its location and, if it is utilized for farming, upon its fertility. Clearly, rich soils usually are more productive than poor ones, well-watered land than desert areas, and so on. In the same way the farm that is closest to market will provide its owner with larger profits than will land at a considerable distance where transportation costs are heavy. The same situation probably holds true for urban sites for commercial and industrial use. A site in the center of the shopping district of a city may be the best location for a department store, and a factory site in an industrial area well supplied with transportation and financial and labor facilities may be best for a manufacturer. The rent of land evidently is related to the desirability of its location for various uses.

Peculiarities of Land Productivity.—The immobility of land may prevent competitive forces from equalizing the supply of land in various locations. Land may be so plentiful in desert areas as to be free: No one would pay to use land there, and there is more than enough to satisfy all comers. At one time in the history of our country this situation was characteristic of much of the land now in farms and other uses. Land may be so scarce in urban areas, on the other hand, that many persons wish to use it and it commands a very high rental. The owner then finds himself in the position of a quasi monopolist. No one can duplicate exactly his piece of property, although others may be much like it. Thus rent bargains are like auctions. The one tenant who most earnestly desires to use the property obtains it because he outbids all the other possible tenants. Since the supply of land thus is relatively fixed, it may command a high price or it may be unable to command any price at all. This latter fact was

not true of the factors of production previously discussed. Men will not work, nor will large amounts of capital be provided, if wages and interest rates reach zero; the same land area usually is available at zero rent as at higher amounts.

Marginal Productivity of Land.—Since little free land can be found today, practically all land in use commands a rent. Thus we may apply the marginal productivity theory to land in a fashion similar to that for labor and capital, but the unique nature of land ownership prevents marginal productivity from establishing a given level of rent for all land. Each plot must be considered separately. However, the marginal productivity of land sets an upper limit to the rent that will be paid for the use of a given plot over a period of time.

If A represents a given class of land in use, and P the product created, the marginal productivity of this class of land would be dP/dA , and the share of the national product which goes to the land owners would be $dP/dA \cdot A$. Thus a third group of variables in equation (16) may be determined.

Lower Limit to a Bargaining Range for Rent.—The upper limit to a bargaining range for rent has been established in terms of the marginal value productivity of land to the tenant who obtains the right to use it. What is the lowest amount that the landlord will agree to take? The highest unsuccessful bidder in the rent auction offered as rent the full marginal value productivity of the land to him, but the landlord chose the offer of the successful bidder instead because it was larger. Therefore the landlord need not accept a rent lower than the amount offered by the unsuccessful bidder and cannot exact a rent greater than the productivity to the successful bidder. Thus a bargaining range for rent may be bounded on the one hand by the maximum amount that will be given by the successful bidder for the use of the land, and on the other hand by the maximum offered by the next highest bidder.

Suppose Mr. X wishes a given plot of land and can afford to pay \$500 per year rent, while Mr. Y wishes the same plot but can pay only \$475 rent. If no offers are higher than that of Mr. X , the owner cannot obtain more than that sum annually for his property, but Mr. X likewise cannot obtain the plot for less than \$476, let us say. In other words, the offer of Mr. Y establishes

an alternative opportunity for the landlord and thus furnishes the lower limit to the bargaining range for this plot.

Rent as an Interest Charge.—Rent, from the businessman's viewpoint, is one of the significant factors in interest charges. Rent payments may take many forms. Consider a factory, for example. First, there is the site rent. The site may be a bare piece of land, or certain improvements may have been made. A railroad spur may have been constructed on the property by the owner, water mains and drainage lines may have been laid, a fence may have been erected, and so on. Second, there is the building rent paid for the factory itself. Third, there may be equipment rents which must be paid, if any of the machinery is leased instead of being purchased. Indeed, it makes little difference whether site, buildings, and equipment are leased or owned so far as the payments for them are concerned. If these items are leased, suitable payments must be made for them; if owned, they should earn similar amounts for the company. In any case, the sums that must be set aside for these items represent payments for their use and thus costs to the user, which do not differ from interest charges for the use of capital.

From the businessman's viewpoint rent and interest payments are identical in nature. Thus the rent charged for a given location determines in which of several uses it shall be employed. A high-rent plot cannot long remain in a low-rent use. Hence we should not expect to see a location like the Empire State Building site used for dairy pasture, simply because of the great divergence in rentals which the two uses would justify.

Relation of Rent to Price.—Most economists consider rent to be quite different from interest or wages in so far as its relation to prices is concerned. They say that rent is "price determined" but not "price determining." In other words, rents are high because prices are high and businessmen can afford to pay high rent, but prices are not high because rents are high for rent is a *result* of price. This position is supported by evidence that is familiar to all of us. Thus United Cigar Stores habitually choose locations on the busiest corners in a city. These locations require the payment of very high rents per square foot, but a package of cigarettes costs no more there than in the suburban drugstore that pays a much lower rental. Economists say,

therefore, that high rents do not make prices high. However, they seem often to imply that high interest rates or high wages do make prices high.

This seeming difference between rent and the other distributive shares does not exist in fact. All the shares are derived payments, as the foregoing discussion has emphasized. High prices make possible high wages, high interest, and high rent. On the other hand, high wage, interest, and rent payments do not make prices high unless they raise unit costs of production. The high rent paid by a United Cigar Store is spread over many packages of cigarettes; the high wages paid by American employers do not always prevent the sale of our goods in foreign countries with low wage scales but with lower productivities per man; and the payment of high interest rates results in high prices only when the productivity of the capital goods obtained therewith is low.

Economic Rent in the Extractive Industries.—The similarity between rent and the other distributive shares appears in a study of the returns in the mining and petroleum industries. In fact, because of the speculative nature of some of these industries, it is difficult to distinguish between interest, rent, and profits.

Consider gold mining, for example. Gold in the spring of 1938 had a fixed price of \$35 an ounce. Unless the cost of producing it was less than this amount, mines could be operated only at a loss. Millions of dollars have been spent hunting for ores that never existed. Indeed, it is said that more money has been spent in gold-mining ventures than the total value of the gold extracted. When land is leased for mining purposes, or when producing mines are leased, the rentals are much more uncertain than they are in agriculture; so much so, in fact, that it would be better to call the payment "profits" instead of "rent." In any event, the mining company buys the leases just as it buys mining equipment, although sometimes share or royalty plans are used instead.

Economic rent in coal mining is quite different, in some respects, from that in gold mining. The price of coal is not fixed by the government. Coal is subject to a fluctuating price, a fact that determines which mines shall be operated profitably at any given time. If coal prices are low, only low-cost mines can be run successfully. As prices rise, poorer mines can be brought into use and thinner seams in the better mines can be worked profitably. The better mines—the low-cost mines—yield a return above the

cost of production in poorer mines. This net gain is the basis of *royalties*.

Petroleum production is similar to coal mining in that the products fluctuate in price and to gold mining in that it is highly speculative. Although the large oil companies have reduced the speculative element to some extent through the services of geologists, and have insured themselves against excessive losses by drilling enough wells so that the poor ones are balanced by good ones, there are still so many "wildcat" wells that oil stock is often regarded as almost synonymous with a lottery. Much economic rent has accrued to the owners of land in oil-producing areas solely because competitive drilling companies, having ascertained with more or less care that the land had oil-producing possibilities, leased large tracts of it in anticipation of future developments. Even though much of the land may not contain sufficient oil to pay expenses, some of it may be near enough to producing fields to enable the lessees to sink competing wells. Thus they may procure enough oil not only to pay for the entire lease but also to yield a profit.

III. THE PROFITS OF ENTERPRISERS

The Entrepreneur.—The various subdivisions of the three factors of production, labor, capital, and land, used in a business must be coordinated properly if it is to operate successfully. The principles which underlie this combination of the factors of production were discussed in Chap. XIII and the necessity of constant readjustment of the factors, in view of the continuous fluctuations of prices and costs, was emphasized. The responsibility for the correct proportion of factors rests upon the man who undertakes the business. The sole proprietor or the partners are the persons who undertake the risk and who exercise the functions of management in unincorporated business, while the voting stockholders who exercise their rights of control fulfill the same functions in a corporation. These men are called *entrepreneurs*, and the reward for successful action on their part is the receipt of *profits*.

Net and Pure Profit.—Accountants and economists differ in their definitions of entrepreneurial profit. The accountant deducts from income all expenses paid to others and calls the remainder *net profit* if it is a positive value. The economist

also deducts *imputed* interest, rent, and salary. Thus if the entrepreneur has invested his own funds, as is usually the case, he should expect to receive the same interest return which he could obtain if the funds were invested elsewhere with the same degree of risk. Likewise, if he uses his own property he should charge himself a fair rent and should pay himself the salary he could secure if he worked for someone else. When these imputed items are deducted from net profit, the remainder, if any exists, is called *pure profit*.

An example may serve to clarify these terms. Assume that Mr. *K* owns a business whose profit and loss account appears as follows for the current year:

Gross receipts.....	\$100,000
Deduct: Cost of goods sold.....	52,000
Gross profit.....	\$ 48,000
Deduct: Interest, rent, and other expenses.....	35,000
Net profit.....	\$ 13,000
Deduct: Imputed interest.....	\$2,500
Imputed rent.....	1,000
Imputed salary.....	8,000
Pure profit.....	\$ 1,500

The accountant is content to determine the net profit of \$13,000, but the economist wants to know the opportunity costs involved in the continuation of this business by Mr. *K*. Under these conditions, Mr. *K* should continue the business, for he secures \$1,500 more income than would be attained if he invested his funds elsewhere, leased his property to others, and worked for someone else at \$8,000 a year.

Suppose the gross receipts had been \$97,000 instead of \$100,000. Net profit would appear as \$10,000, but pure profit would be turned into a deficit in so far as the imputed items are concerned. His imputed salary would be reduced to \$6,500. If this situation is likely to continue, Mr. *K* might decide to close out the business because his income would be increased if he worked for someone else at \$8,000 per year. He may prefer to be his own "boss," of course, and so may elect to continue the business in any case. On the other hand, he may decide to avoid the assumption of risk and may give up the \$1,500 of pure profit obtained in the first instance in order to work for someone else who in turn

assumes risk; but in any case Mr. *K* knows just where he stands in terms of the various opportunities open to him if he takes the imputed incomes into consideration.

Pure Profit a Surplus Income.—If we assume that the imputed items cover the opportunity costs as far as Mr. *K* is concerned, he will continue the business as long as he recovers these amounts. Pure profit is “pure velvet” for him. Income in excess of the imputed costs is a surplus income which is not necessary to the continued operation of the business. On the other hand, the imputed items must be covered in the long run if operation is to continue. Hence we rightfully may consider them as costs of production from the viewpoint of society as a whole.

Profits or Losses, the Variable Factor.—Since profits or losses are to be found in the difference between cost and selling price, it follows that their exact amounts cannot be determined in advance of production and sale of the goods. The best that can be done must be in the nature of an estimate. Furthermore, there will be a profit or a loss in practically every case, since it would be a mere coincidence if selling price were exactly equal to cost.

There is uncertainty as to *costs* because of the difficulty in forecasting such items as material and labor costs and overhead charges per piece, or the possibility that such unforeseen contingencies may arise as mistakes in the treatment of materials or in the chemical composition of products, or labor troubles, or legal difficulties. Conversely, warehouses may be well stocked with raw materials when prices rise, more efficient methods of production may be introduced, anticipated difficulties may not materialize, or competition may cease to be active.

Uncertainty as to *receipts* grows out of the activities of consumers. The maker of surveying instruments, for example, knows only that his types of goods have been used in the past and probably will be used again. He does not know how much of the business may go to his competitors, or the price at which the instruments will sell to best advantage.

Corporation Profits.—The analysis of profits in an incorporated business is similar to that just given in so far as the determination of net profit is concerned. Assume Mr. *K*'s firm discussed above was incorporated instead of being a proprietorship. The income account then would read as follows:

Gross receipts.....	\$100,000	
Deduct: Cost of goods sold.....	52,000	
Gross profit.....	\$ 48,000	
Deduct: Interest, rent, and other expenses.....	35,000	
Net profit.....	\$ 13,000	
Dividends declared.....	\$9,000	
Carried to surplus.....	4,000	13,000

It is difficult to decide when pure profits are obtained from corporate activity. Dividends on preferred stock often amount to no more than interest payments to junior security holders. Indeed, owners of Class A non-voting common stock can be called entrepreneurs only by a stretch of the imagination which assumes that they take the risk without exercising the control which goes with that function. If many of the common stockholders invest for income and not for control, their security may be regarded as a peculiarly risky form of income bond without maturity. Thus almost the whole of dividends may be considered as interest payments. Shall pure profit be confined, then, to amounts carried to surplus? Perhaps it would be better to say that any rate of return to the corporation as a whole greater than that needed to attract new capital as it is required is evidence of pure profits. To what extent have corporations been successful in attaining such rates of return?

Postwar Corporate Income.—It is significant that over 40 percent of all corporations have sustained a deficit even in so-called good years. Business is not always profitable. In the depression year 1932, over 83 percent of all corporations in the United States

TABLE 51.—CORPORATE NET INCOME AND DEFICIT, 1928–1932*

Year	Number of corporations	Total net income (millions)	Profit made (millions)	Percent of total number	Net loss sustained (millions)	Percent of total number	Interest paid (millions)	Cash dividends paid (millions)
1928	495,892	\$8,227	\$10,618	54.2	\$2,391	45.8	\$4,581	\$7,074
1929	509,436	8,740	11,654	52.9	2,914	47.1	4,925	8,356
1930	518,736	1,551	6,429	42.7	4,878	57.3	4,861	8,202
1931	516,404	-3,288	3,683	34.1	6,971	65.9	4,492	6,151
1932	508,636	-5,644	2,153	16.3	7,797	83.7	4,043	3,886

* "Statistical Abstract of the United States," 1936.

sustained losses. The record of the significant 5-year period, 1928 to 1932, appears in Table 51. Note that in 1930 and thereafter cash dividends paid out exceeded the net income of those corporations that made a profit. In other words, a large portion of these dividends were declared out of surplus instead of earnings.

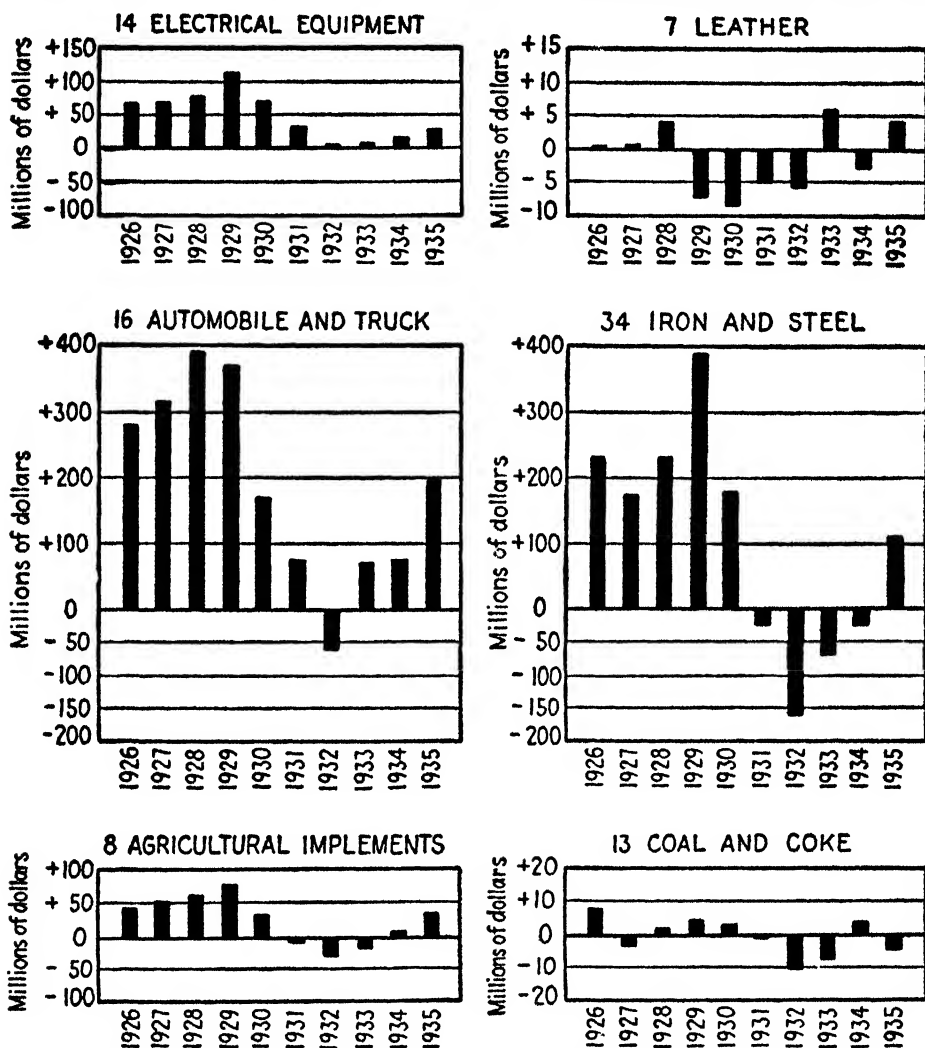


FIG. 42.—Net profits (+) or losses (−) for stated number of companies in selected industries, in millions of dollars, 1926–1935.¹

Variations in Earnings.—Earnings vary among industries and among corporations within a given industry. In the predepression year 1927, for example, Laurence H. Sloan of the Standard Statistics Company found the earning rate on invested capital for selected industries to be as follows:²

¹ Moody's "Industrial Securities," 1936, pp. 33–34; scales are not identical for all industrial groups.

² SLOAN, L. H., "Corporation Profits," Harper & Brothers, 1929, p. 140.

Industry	Percent
Drugs, medicines, cosmetics.....	22.22
Automobiles.....	20.49
Lead and zinc.....	17.45
Food products.....	15.18
Chemicals.....	12.68
Electrical equipment.....	11.73
Building equipment and supplies.....	9.53
Copper.....	7.47
Steel.....	5.63
Oil.....	5.50
Coal.....	1.51
Fertilizers.....	- 1.39 (loss)

Figure 42 shows net profits (or losses) in millions of dollars for the designated number of companies in six selected industries. The electrical equipment industry group was the only one of the six to escape losses during the period. On the other hand, the iron and steel companies made 137 million dollars more in profits in the single year 1929 than their combined losses for the 4-year period, 1931-1934.

The *percent* change in net profits (or losses) sometimes varies considerably over a short period of time. Thus, as Table 52 indicates, net profits of fifty-eight iron and steel companies were

TABLE 52.—PERCENT CHANGE IN DOLLAR VALUE OF NET PROFIT* OF SELECTED INDUSTRIES FROM 1936 TO 1937†

Number of corporations	Industry	Percent change
58	Iron and steel	+53.9
60	Electrical equipment	+27.5
31	Chemicals	+ 4.0
90	Electricity, gas, etc.	+ 2.5
26	Containers	- 0.1
20	Automobiles	-18.9
22	Rubber tires, etc.	-31.6
141	Class I railroads	-40.5
24	Coal mining	-93.5

* After depreciation, interest, taxes, and other charges and reserves, but before dividends.

† *National City Bank Bulletin*, April, 1938, p. 45.

53.9 percent higher in 1937 than in 1936. During the same period, net profits of twenty-four coal-mining companies declined 93.5 percent.

Profit and Risk Assumption.—Under a system of private property the driving force behind business and industry is the ever-present possibility of making profits. This statement does not mean that profit making *should* be the motive, or that there are no *other* motives, or that no *stronger* motives can be found; it merely recognizes things as they are.

Some persons regard profits as a reward for risk assumption, the income of the adventurer, just as wages are the income of the worker. They assume that if the maximum sum which could be realized merely covered wages, interest, and rent, persons would not be willing to run the chance of incurring losses. This point has been recognized in government price fixing and price regulation. In order to deny profits it sometimes has been necessary to guard against losses. It is not reasonable to suppose, however, that people would do without goods merely because they were denied the opportunity to make a profit. Production still would go on, but possibly not under the private ownership of industry.

Instead of saying that profits are the reward for risk assumption, it is better to say that "risks make profits possible." Risk deters many persons from going into this or that adventure; it thus gives the daring ones a better chance to make profits. Profits, then, may be explained in part by the scarcity of business ability, just as the scarcity of workers in certain types of occupations will account for the higher wages received by persons in those occupations. Furthermore, many risks are measurable and can be guarded against through insurance devices. The expense of guarding against these measurable risks is a part of the cost of production and in no sense can be considered as a reward.

Some Causes of Profits and Losses.—It is possible to list many causes for profits and losses, but only a few outstanding points will be mentioned here. *Efficiency* in production and sales is responsible for the receipt of surplus income by many concerns. Thus General Motors is an example of a holding company which produces efficiently a diversified list of products. Its research, shop management, and sales and advertising policies are particularly important. *Differences in cost* due to factors beyond the control of management permit some firms to receive a net income while others suffer losses. For instance, a copper company made

profits because its ores were high in silver and gold content. A brick company was able to underbid all competitors because it had both clay and coal on its properties less than 200 yards apart. Thus its costs were lower than those of other plants. These examples really are instances of implicit rent rather than of profits, however, since the advantages were beyond the control of managers and so went with the titles to the properties.

Profits frequently accrue to the concern *first in the field*. Thus the first persons to promote miniature golf, to raise silver foxes, or to produce safety razors have been able to reap large returns before competitors entered the field. Priority advantages often apply to mercantile establishments as well.

Established concerns, long on the ground, have a tremendous advantage. They are, for one thing, usually in the possession of the best locations. In rapidly growing cities in which the center of retail shopping is drifting, this is not a permanent advantage. A firm's prosperity may hinge on whether its directors have the nerve to pull up and move to a new location "far up town." . . . Furthermore, the established concern has long since built up its custom, its goodwill. It can rely upon the habits of its customers, whereas the new concern has to rely upon the stream of folk passing its show windows and upon aggressive and expensive advertising. . . . The old, established firm is quite likely to have the advantage in point of size. . . . Like the advantage of location and goodwill, advantage as to size may be due to priority. The founder of the firm came to town early, the town grew, and the firm grew with it, almost automatically.¹

Changes in demand are the cause of profits or losses in many cases. Thus the demand for carriages and wagons declined tremendously in the 25 years after 1900. As a result, the 7,632 establishments engaged in the production of these articles at the turn of the century had dwindled to 152 by 1925. Price *fluctuations* also are significant. The period of rising prices during the World War permitted manufacturers to purchase materials, equipment, and labor at one price level and to sell the finished articles produced therewith at a higher price level. Thus profits frequently were obtained in spite of high costs and other ineffi-

¹ WOLFE, A. B., Competitive Costs and the Rent of Business Ability, *The Quarterly Journal of Economics*, Vol. 39, November, 1924, pp. 62-63.

ciencies. Public utilities, on the other hand, were unable to raise their rates as fast as costs rose; therefore they suffered a restriction of profits or underwent actual loss.

Restriction of output may enlarge profits if the business enjoys monopoly advantages. From this viewpoint the chief advantage of monopoly is the fact that it reduces risk and therefore tends to enhance profits. Risk is reduced because the monopolist is faced with only two variables, *i.e.*, changes in cost and changes in demand, while the competitive producer must contend with a third variable in addition, namely, the activities of his competitors.

Competition, Change, and Profits.—A large portion of profits and losses are due to *change*—change in demand, or prices, or costs, or competition. Indeed, economists have said that an economic system devoid of change of any kind except that due to competitive forces would prevent entirely the existence of *pure profits*. Such a *static society* would have no new discoveries, no population growth, no changes except the competitive adjustments necessary to reach perfect equilibrium. Since the receipt of pure profit indicates that prices are well above costs, competition would lower prices until income barely covered the imputed shares. In terms of the discussion in Chap. XIV of marginal and superior producers, the net income obtained by the latter is a larger imputed salary owing to superior managerial ability, while the marginal producer obtains an imputed salary not much different from the wages of skilled labor. Pure profit disappears in this case, and net profit covers only the imputed shares in income.

This assumption, however, presupposes *free competition*. Since many lines of industry are not freely competitive, monopoly and scarcity profits are obtained by these concerns. We may list exploitation profits as an extreme form of such income. From the poorly paid taxi driver who may try to eke out an extra nickel on fares to the salesman of "dry-hole" oil-well stock, exploitation exists and the gullible public all too frequently is cheated. National efficiency demands that each worker and each company justify his and its existence by making a contribution to the sum total of utilities embodied in the end products of industry. The noted English economist R. E. Tawney concisely states the principle in this way: "Society must persuade its members to renounce

the opportunity of gains which accrue without any corresponding service."¹

IV. SUMMARY OF DISTRIBUTIVE SHARES

The shares in the national income which go to each of the factors of production are determined in general by the marginal value productivities of the factors. Thus it is said that each unit of the productive factors is compensated on the basis of its contribution to the national income. The rates of wages, interest, and rent, when multiplied by the number of workmen, and the amounts of capital and land, yield the shares in the income which each of the factors receive. Pure profit is a residual share due in part to imperfect competition and constant change, and in part to the failure to compensate the other factors on the basis of full marginal productivity. Since competitive forces do not have entirely free play in determining these rates, bargaining ranges exist within which the rates of wages, interest, and rent are established. The upper limits of these ranges are fixed by marginal value productivity. The lower limits are determined by the peculiar characteristics of demand and supply for each of the factors concerned.

The rates of compensation for the factors of production actually are determined *simultaneously* with the prices of the products of industry. This interrelationship is significant, for a change in the productivity of a factor of production affects not only the compensation of that factor and of other factors but also the prices of consumption goods and the real income of the entire community. An increase in the number of workmen, for example, tends to reduce the productivity per worker and the rate of wages; it may increase the landlord's share in the national income and may result in lower prices for some commodities.

When the rates of compensation for the factors of production have been determined on a national basis, employers use various amounts of the factors in terms of the cost rates thus established. The number of workmen and the amounts of capital and land to be combined in a going concern depend upon the costs and prices which the entrepreneur finds in the market place, on the basis of the principles established in the treatment of factoral propor-

¹ TAWNEY, R. E., "The Acquisitive Society," Harcourt, Brace & Company, 1920, p. 184.

tion. From the employer's viewpoint, then, the rates of wages, interest, and rent are costs which must be covered by receipts if profits are to be secured. From the social standpoint, on the other hand, higher rates for these factors raise prices only if they raise unit costs; to this extent they are price determining, but otherwise they are price determined, for the values of the factors are derived values which are not inherent in the factors themselves.

Problems

123. "According to the marginal productivity theory of capital, interest rates are supposed to equate saving and investment. Since there is little new investment at present and large savings are available for investment, it is clear that interest rates have not equated saving and investment." Is this true? Why, or why not? What light do the interest rate data presented in this chapter throw upon the question?

124. How would the rate of interest be affected by each of the following items? Explain briefly in each case.

- a. Increased buying of consumption goods on credit?
- b. Increased social prestige attaching to the possession of capital?
- c. Widespread knowledge that consumption goods would soon double in price?

125. Mr. X earns \$3,000 per year. How may he use installment buying to obtain \$4,000 worth of goods and services this year? Can he obtain \$4,000 worth of goods and services next year? How much can he purchase the third year, if he pays each year's installment debts during the following year? In the fourth year?

126. "The greatest single cause of poverty today is the private receipt of land rent. High living costs are the direct result of the landowners' monopoly of the one thing essential to everyone's existence, to wit, the earth's surface." Discuss.

127. a. If the cost of building a mile of gravel road is \$6,000; a mile of concrete road, \$20,000; and a mile of brick road, \$25,000; and if the annual upkeep cost per mile is \$900 for the gravel road, \$300 for the concrete, and \$150 for the brick, which road will be the most economical when the current rate of interest is 2 percent? 4 percent? 8 percent?

b. On the basis of this problem, what conclusion can be drawn relative to the effect of interest rates on the building of expensive forms of construction work by governments or corporations?

128. A city purchases 14,000,000 kilowatt-hours of electrical energy a year at a cost of 1.8 cents per kilowatt-hour. Engineers estimate that the city could build its own plant for \$1,000,000; that operation and maintenance cost would amount to \$110,000 a year; depreciation $6\frac{1}{2}$ percent and insurance one-half of 1 percent. Below what rate of interest must the city succeed in borrowing funds if the venture is to be a financial success? How should it borrow the money? What other factors should be taken

into consideration in deciding the merits or demerits of a city-owned power plant?

129. A railroad company has the choice of constructing a tunnel through a mountain or of going around the barrier. The tunnel will cost \$6,000,000 and will involve a daily upkeep charge of \$80. Building a road around the mountain will cost only \$3,000,000, but the additional daily cost of sending trains over the longer route, including upkeep, will be \$500. Which method is preferable when the interest rate is 4 percent? 8 percent?

130. "The judgment of the business manager is the cause of profits or losses." If this is true, why should not "profits" be called "wages"? Why should not corporations bid against each other for competent managers until the managers receive as wages all that now goes to stockholders as profits?

131. James Jennings bought a new electric refrigerator under a plan which required no down payment, but simply payments of \$10 each at the end of every month for 12 months. After he had made six payments, his pay was cut, and he could not spare \$10 every month. Jennings found three alternatives: (1) he could return the refrigerator in settlement of the balance due and lose his payments already made, or (2) he could sell the refrigerator to a friend for \$65 cash, and pay off the balance due, in which case he would receive a rebate of 90 cents of the carrying charge, or (3) he could borrow \$60 from a small loan company to be paid \$6 a month plus interest at 3 percent per month on the balance of principal remaining due in each month, in which case he would pay the balance due on his original contract and would receive a rebate of 90 cents from the seller. If he gave up the electric refrigerator and used his old ice refrigerator, the monthly ice bill would be \$1.50 more than the cost of current for the electric refrigerator. Which alternative would you choose? (Pollak Foundation.)

132. Consider some of the problems that arise when a certain company has obtained a contract which will demand the services of fifty trucks for a year (300 working days). Should new trucks be purchased and drivers hired, or should trucks be leased from a trucking concern? Immediately the question of comparative costs appears. Here are the essential facts:

New trucks would cost \$4,000 each; daily upkeep (gasoline, oil, repairs, and insurance) would amount to \$6 per working day on each truck. The driver of the truck would receive \$5 per day. At the end of the contract period the trucks would have a salvage value (*i.e.*, used-truck value) of \$1,200 each.

On the other hand, a truck and driver could be leased from a trucking company at \$20 per working day. The trucking company would pay all operating expenses.

What additional data would be useful (or necessary) in arriving at a decision?

133. The Twentieth Century Fund, Inc., in a study of corporation profits for 1933 reached this conclusion: Large corporations that made profits made them at lower rates than small ones, while large corporations that lost money lost at lower rates than small ones. Bigness seemed to act as a stabilization factor. It tended to keep rates of profit or loss within a

narrow range. Smallness, on the other hand, seemed to be a leverage factor which tended to cause wide swings. What explanation can you give for these results?

References

- BÖHM-BAWERK, E. VON: "Capital and Interest," Brentano's, Inc., 1922.
- CASSEL, GUSTAV: "The Nature and Necessity of Interest," The Macmillan Company, 1903.
- EPSTEIN, RALPH C., assisted by FLORENCE M. CLARK: "Industrial Profits in the United States," Publication 26, National Bureau of Economic Research, 1934.
- EVANS, G. C.: "Mathematical Introduction to Economics," McGraw-Hill Book Company, Inc., 1930.
- FISH, J. C. L.: "Engineering Economics," 2d ed., McGraw-Hill Book Company, Inc., 1923.
- FISHER, IRVING: "The Rate of Interest," The Macmillan Company, 1907.
- FOREMAN, C. J.: "Efficiency and Scarcity Profits," University of Chicago Press, 1930.
- FOSTER, W. T., and W. CATCHINGS: "Profits," Pollak Foundation for Economic Research, 1925.
- GRANT, E. L.: "Principles of Engineering Economy," rev. ed., Ronald Press Company, 1938.
- KNIGHT, F. H.: "Risk, Uncertainty, and Profit," Houghton Mifflin Company, 1921.
- : Profit, "Encyclopedia of the Social Sciences," The Macmillan Company, 1934.
- NERLOVE, SAMUEL H.: "A Decade of Corporate Incomes, 1920-1929," University of Chicago Press, Chicago, 1932.
- RIEFLER, WINFIELD W.: "Money Rates and Money Markets in the United States," Harper & Brothers, 1930.
- ROBINSON, L. N., and ROLF NUGENT: "Regulation of the Small Loan Business," Russell Sage Foundation, 1935.
- Twentieth Century Fund, Inc.: "How Profitable Is Big Business?" 1937.
- WICKSELL, KNUT: "Interest and Prices: A Study of the Causes Regulating the Value of Money," Macmillan & Company, Inc., 1936.

PART IV
ECONOMIC PROBLEMS

CHAPTER XIX

INVESTMENTS

The term "investment" is understood in a general way by most people. When we attempt to view it precisely in a practical way, however, we run into many difficulties. In general, investment means the employment of money in the purchase of bonds, stocks, mortgages, or property, or in one's own business. Such commitments of funds are for the purpose of receiving interest, dividends, or profits and for maintaining the principal.

In financial parlance investment has a broad meaning but does not really distinguish between the terms investment and speculation. While the dividing line between these concepts cannot be stated with mathematical exactness there is a clear distinction between them. Briefly stated, investment is a financial transaction representing the employment of surplus money. The transaction, however, must be based upon a careful analysis of facts and the application of standards. If the study shows there is a high degree of safety for the principal and that a good return probably will be received, the commitment can be called an investment. If after a thorough study there is substantial uncertainty with respect to both principal and income a commitment would be speculative.

Speculation, as carried on today, is primarily the process of attempting to forecast market movements with the idea of buying and selling securities and commodities for the purpose of gaining a return from changes in market prices. Speculation in securities is largely limited to trading in stocks, although it is possible to trade in bonds. Convertible bonds and bonds of questionable safety will fluctuate widely in price, thus affording greater opportunities for speculation.

I. INVESTMENT ANALYSIS

Economic Basis of Investment Values.—The investor purchases the right to an income, either present or prospective. If a bond, stock, real estate mortgage, or any other form of investment does

not yield an income in the present and no one expects it to yield an income in the predictable future, it is not likely to have much, if any, market value. Nor is there much likelihood that it will appreciate in value in the future if there is no income in sight to form the basis of a rise in value. Unless something has use-value or income value it will be devoid of market value.

In the economic sense, income must be *capitalized* to determine the value of the thing which yields the income. Capitalization results in the determination of the principal sum upon which a given interest rate will yield the annual income involved. Given the amount of income, therefore, there remains the choosing of the proper interest rate, which is the rate one can obtain by putting his funds in other investments of comparable qualities. Suppose a plot of commercial property yields an income of which \$600 may be imputed to the land. If this economic rent is expected to continue at that value in perpetuity, if the income is "net," and if the assumed interest rate is 5 percent, the value of the land would be:

$$\$600 \div .05 = \$12,000$$

In other words, the investor will receive \$600 annually on an investment of \$12,000, which is 5 percent, or the rate he desires. Similarly, if a share of preferred stock of \$100 par value pays 7 percent dividends annually and the investor seeks the same rate of return as above, he would be willing to pay, other things being equal, as much as \$140 per share for the security.

The Value of Limited Income.—When an investor purchases the right to an income for a specified number of years instead of in perpetuity, the valuation problem is more complex. Since bonds usually bear a definite maturity date, it is necessary to compute not only the present value of a stated number of interest payments but also the present value of the principal which is to be repaid. The present value of the principal is found from the equation

$$Pv^n = P(1 + i)^{-n} \quad (21)$$

where P represents the principal, and v^n the present value of \$1 discounted at rate i for n interest periods. The present value of the interest payments, where I represents the interest paid at each interest period and $a_{\overline{n}|i}$ the present value of an annuity of

\$1 discounted at rate i for n interest periods, is obtained from the following equation:

$$Ia_{\overline{n}|} = I \left(\frac{1 - v^n}{i} \right) \quad (22)$$

The sum of equations (21) and (22) gives the value X of the bond when the speculative element is included, thus:

$$X = Pv^n + Ia_{\overline{n}|} \pm ? \quad (23)$$

Suppose a \$1,000 bond bears interest at 6 percent payable semi-annually and is redeemable at the end of 10 years. The bond is to be purchased at a price that will yield 5 percent on the investment. How much must be paid? $Pv^n = \$1,000 \cdot V^{20} = \610.271 , the present value of the principal at $2\frac{1}{2}$ percent semi-annually, and $Ia_{\overline{n}|} = \$1,000 \cdot (0.03) \cdot A_{\overline{20}|} = \467.675 , the present value of the interest payments at $2\frac{1}{2}$ percent semi-annually. Thus the price of the bond is $X = \$1,077.95 \pm ?$. If the investor proposes to hold the bond until maturity and is sure that no default will occur, $? = 0$, but "the schemes o' men gang aft a-gley" and the speculative element usually will be present to some extent until the final payment of interest and principal. The values of V^n and $A_{\overline{n}|}$ may be obtained most readily from investment tables.

Investment Characteristics.—Since investors are not all alike, it follows that an investment suitable to one may be unsatisfactory to another. The individual must choose among the various types of investments so as to select those whose characteristics best fit his requirements. Six elements that may be considered in this choice will be noted.

Some persons place *safety of principal* above all other factors. They wish to avoid risk and so demand a well-secured investment whose principal is safeguarded adequately. Others consider *regularity of income* to be most important, and so seek an investment which is self-sustaining. The purpose for which the funds are sought must make possible the payment of a regular income, or the financial strength of the borrower must be sufficient to assure regular payment. Some investors insist upon the right to exercise *control* over the use of their funds. They purchase voting stock and take part, along with others, in the direction of the fortunes of the corporations in which they are interested.

Other investors desire *freedom from care* and so may place their funds in a savings account, in a trust fund, or in an annuity or may purchase government or corporate bonds. In certain cases *liquidity* is an essential item. Thus banks, insurance companies, and individuals invest a portion of their funds in readily marketable securities instead of in real estate mortgages, since the security exchanges usually provide facilities for prompt sale without marked loss. *Net yield* also is a significant factor so that tax-exempt investments often are preferred to those subject to taxation. Government bonds as a group are exempt from certain taxes and are desired for this reason in spite of the lower rate of return which they yield.

Obstacles to Investing.—There are many obstacles to successful investing, such as inadequate or unreliable information, market and psychological factors, dynamic economics, and the uncertainties of the future. Further, there are almost innumerable types of securities which make the problem more complex. These instruments represent nearly 400,000 corporations, nearly 200,000 governmental units and untold thousands of individual pieces of real estate. Then the whole field of investment is subject to change. Not only is the credit of many individual corporations, municipalities, and other groups of enterprises subject to change, but the whole economic system oscillates periodically between booms and depressions.

The individual investor often fails not only because of a lack of training and experience but also because of downright carelessness in purchasing securities. A large number of investors lose their savings in poor business adventures or in speculation. The investor's desire to "get rich quick" plus his egotism has made him gullible and easy prey for clever salesmen and promoters. There are a multitude of dangerous appeals to the investor against which he should guard. A program of safety and certainty should not be sacrificed for one of magic—the lure of big gains. To do so may bring temporary luck and one's funds may multiply many fold. Such ventures, however, nearly always come to grief in the end. Anything less than sound, conservative investing is almost certain to result in financial failure to the average investor.

Media of Investment.—Before the investor makes any kind of investment he should have a clear understanding of the

media for investing surplus funds. Because of unfamiliarity with investment processes, lack of time, inadequate facilities, or no desire to be an investor, the individual may prefer to buy life insurance or annuities as the medium for employing his surplus funds. He may prefer to place his money in a savings bank, turn it over to a trust institution, deposit it with some kind of investment association, or have an investment counselor do his investing for him. If, however, he wishes to do his own investing he has a wide choice of investment media, the leading types of which will now be described.

The principal real estate investment instruments are mortgages, trust deeds, and real estate mortgage bonds. The *real estate mortgage* is a pledge of real property as security for a loan. The investor obtains a contract specifying that if the terms of the loan are not complied with he can take legal disposition of the property. The *trust deed* is similar to the mortgage. The title to the property pledged as security for the loan is transferred to a trustee. If the debt is satisfied in full the title is returned to the borrower; if the borrower defaults, it is transferred to a purchaser under a legal sale for satisfaction of the debt. A *real estate bond* is a contract supported by a deed of trust whereby the real estate is mortgaged to a trustee for the benefit of all the bondholders.

Government bonds are those issued by civil authorities and include those of federal, state, county, city, town, and other tax districts. They are based on the general credit of the political area; that is, they are secured by the taxing power of a community.

Municipal bonds may be divided into various classes. The principal ones are the "direct and general" obligations. The full faith and credit of the civil division are pledged for the payment of principal and interest of these bonds. *Special assessment* bonds are not secured by the full faith and credit of the entire community, but are payable only out of assessments levied upon property which has been benefited by the specific improvements for which the bonds were issued. If the city is required to assume these obligations in case of deficits they may be considered "generals."

Tax-anticipation notes or *certificates* are issued against taxes levied but uncollected. They are short-term instruments issued to finance a community until taxes are collected and are a first

claim upon tax revenues. *Revenue* bonds are obligations issued by a civil division to pay for public utilities to be operated by the municipality. They are supported from the earnings of these properties.

There is a great variety of corporate bonds (see Chap. V). Those secured by a pledge of property are *mortgage* bonds. There are first mortgage or *senior* bonds and second mortgage or *junior* bonds. First mortgage or senior bonds have a first claim upon both the earnings and the property of a corporation. Junior or second mortgage bonds make up a wide list of issues possessing a great variety of names, some quite misleading. These issues have a secondary claim upon corporate property and earnings. *Collateral trust* bonds are secured by the pledge of other bonds and stocks which are owned by the corporation. Equipment trust certificates are secured by a pledge of railroad equipment. Corporate bonds that are not secured directly by any specific property, but instead are based upon the general credit of the corporation, are termed *debenture* issues. There are also a number of other types of corporate bonds such as guaranteed, assumed, adjustment, and so on.

Preferred stocks represent ownership in a corporation. They are like common stocks except for certain preferences or limitations which they may contain as specified in the charter or by-laws of the corporation (see Chap. V). *Common stocks* represent an unrestricted but residual ownership in a corporation; that is, they have a prorata interest in the assets and earnings after prior claims represented by bonds and preferred stocks have been met. Common stocks, although they generally have sole voting power and thus control the company, are also subject to the highest investment risks.

General Principles of Investment.—Regardless of whether the investor selects mortgages, bonds, or stocks he should buy securities which, upon thorough study, promise safety of principal and a satisfactory return. We shall now consider some general investment principles he should have in mind when selecting such securities.

An investment will not be safe merely because it is secured by a mortgage, or has a specific lien, or is safeguarded by some legal requirement. It is rarely feasible for the investor to foreclose and to sell the property in order to protect himself or to bring

legal proceedings to enforce a contract. These factors may be of some value but they should not be relied on too greatly for protection. When an enterprise defaults on its obligations there is an impairment of investment value. Both income and principal are endangered. Investments should be made with chief emphasis upon avoidance of loss.

The safety of an investment is best measured in terms of *economic capacity* rather than in terms of contracts and liens. Safety should be determined on the basis that the security issuer be sound and have ample earnings or revenues to cover all of its obligations. Moreover, the selection of securities for investment should be limited to those enterprises which meet specific quantitative tests and that can do well when business conditions are unfavorable as well as favorable. It is under the final test of depression that the advantages of good over weak issues appear, for at such a time many investments ordinarily maintained are lost or severely depreciated.

Selecting Investments.—In selecting investments of any type, the investor should give special consideration to the major influences affecting investment values. The economics of a particular field of investment or of a given industry must be analyzed if one is to have an adequate background for investing. Definite investment standards should be set up as guides for choosing specific issues.

United States Government Obligations.—All securities of the United States government are regarded as “gilt-edge” investments. They are deemed to be amply protected and are the most liquid type of investment in existence. The principal types of these obligations are: Treasury bonds; Panama Canal bonds; Treasury notes, certificates, and bills; and United States savings bonds. There also exist a number of securities, such as those of the Home Owners’ Loan Corporation, for which the faith of the United States is pledged to provide for the payment of the interest and principal, but these bonds are not issued directly by the federal government.

State Bonds.—In general, state bonds, which are secured by the tax revenues of the states, are accorded a high investment rating. It is only natural that there would be a considerable difference in investment quality in state bonds. The chief investment appeals of these bonds are safety, stability, liquidity, and tax exemption.

In selecting state bonds the following are some of the factors which should be covered in an analysis:

- Economic resources and taxable wealth of the state.
- Ratio of taxes collected to taxes levied.
- Economic, business, and commercial activities in the state.
- Character, density, and trend of population.
- History and record of debt finances.
- Legal factors.
- Wealth and debt factors.
- Current financial operations.

Municipal Bonds.—There is a great variety of municipal obligations which have been issued by more than 100,000 counties, cities, school districts, and other political subdivisions of states. The aggregate of these bonds exceeds 18 billion dollars. The comparatively satisfactory investment record of municipal bonds for some decades prior to the depression fostered a feeling of great confidence in this type of security. In consequence some investors became negligent and failed to give adequate consideration to municipal finances. When the depression came many municipalities became unsound financially so that there were a number of defaults. Investors lost millions of dollars as a result. While the investment losses were relatively smaller than in many other fields, they emphasized the need for a critical attitude by proving that “municipals” are considerably affected by economic and financial disturbances.

Municipal credit rests largely upon the ability of a political unit to levy and to collect taxes with which to pay its obligations. Since taxpaying ability is predicated upon various economic factors one should consider the economic and business elements which are basic to the wealth and development of a community. Its geographical location, age and debt record, the nature of the tax lien, debt restrictions, budget, and current finances are always important considerations. The following are some of the prerequisites of satisfactory municipal bonds:

1. The bonds should be the direct obligations of the political unit and should be secured by the unlimited taxing power of the community.
2. The community should have ample economic resources, a favorable growth trend and substantial wealth upon which to levy taxes.
3. Population of the area should be a reasonable minimum, say 10,000, and should be composed of a solid citizenry.

4. The debt record of the municipality should be satisfactory. (There should have been no defaults on obligations, or delays in meeting them of more than 120 days, during the preceding 15 years.)

5. The net debt of the municipality should not be too high. (The net debt of places of comparatively small population should not be more than 5 or 6 percent of the assessed valuation and of larger cities not more than 10 percent. The assessed valuation should be adjusted to a 100 percent basis because some communities assess at 50 to 75 percent of the true valuation.)

6. Tax collections should be satisfactory. (Not less than 80 to 90 percent of the taxes should have been collected for the last fiscal year, depending upon the stage of the business cycle.)

7. Current finances should be sound.

Real Estate Mortgages.—Real estate mortgages have been one of the most popular mediums of investment in the United States. Their investment standing is traditional. Such investments, however, vary greatly in quality and unless they are selected carefully the investor may suffer losses. Real estate mortgages have a comparatively slow market. They are not liquid and therefore the investor cannot easily recover his funds.

The major factor to be considered in mortgage investments is the value of the land and buildings pledged as security. This value is derived from the earning power of the real estate, or from its sale value, which is closely related to earnings. Since valuation is of paramount importance the investor must analyze this factor. Misleading appraisals was one of the main causes of collapse in real estate investments during the depression. Appraisals sometimes placed artificial values on properties which, along with "high-pressure" sales and promotion methods, resulted in mortgage loans in excess of real values.

Residential valuation may be determined from a consideration of the physical characteristics of the property, location factors, rental values, tax assessment, sales and listing prices of neighborhood residential properties, and actual costs. The valuation must not reflect a speculative situation or abnormal costs. The loan should not exceed more than 50 to 60 percent of the conservative value of the property. The debt services should not be more than about 75 to 90 percent of the rental value. The rental value may be determined on the basis of the typical rental being received for similar properties. The life of the mortgage should not be more than 60 to 70 percent of the remaining economic life of the building and the loan should be amortized over

the life of the mortgage. The investor should also give due consideration to the borrower. Points to consider are reputation, past record, ability to pay, and prospects for the future.

Real Estate Bonds.—Real estate bonds as a class have not been good investments. Uneconomic financing, excessive valuations based on misleading appraisals, abnormal rental estimates, excessive construction costs, gross errors of judgment, misplaced buildings, and other factors have resulted in an unprecedented collapse in these bonds.

Real estate bonds should be a participation in a first mortgage on a new apartment house, office building, or good business property. The actual value of the property should exceed the amount of the bond issue by 50 percent or more. Average earnings from the property for a period of 6 to 8 years should cover interest requirements at least twice. Due consideration should be given to probable losses through vacancies and declines in rentals. Special-use properties such as hotels, theaters, and garages are generally not desirable for real estate bonds. They are business ventures and should be analyzed as such.

Practical Real Estate Valuation.—The problem of land-value determination in practice is a very complicated one. Several different methods may be used in different cases, depending upon the information available in each instance. One valuation analyst says the theoretically correct method

proceeds, by discounting, to a calculation of the present value of the net returns, the building returns being for finite building lives, and the land returns being extended to perpetuity. In the method, the building value is so determined that the predicted building return provides both interest and a return of the capital value over the building life. Rates are determined in the market.¹

In order to approach as closely as possible to this ideal, one of three methods ordinarily is used. The *income* method of real estate valuation is based upon known income from commercial tenants, or upon estimated income where an apportionment of business profits must be made between land and chattels or management. When the income method cannot be used, the *market comparison* valuation may be substituted.

¹ BABCOCK, F. M.: "The Valuation of Real Estate," McGraw-Hill Book Company, Inc., 1932, p. 165.

Thus the only income yield of residential property may be psychic in nature. In valuing such real estate an attempt may be made to compare it with similar property which has changed hands recently. A third method involves valuation on the basis of *replacement cost*, which may be used when no earnings are produced by the real estate in a form that permits estimation.

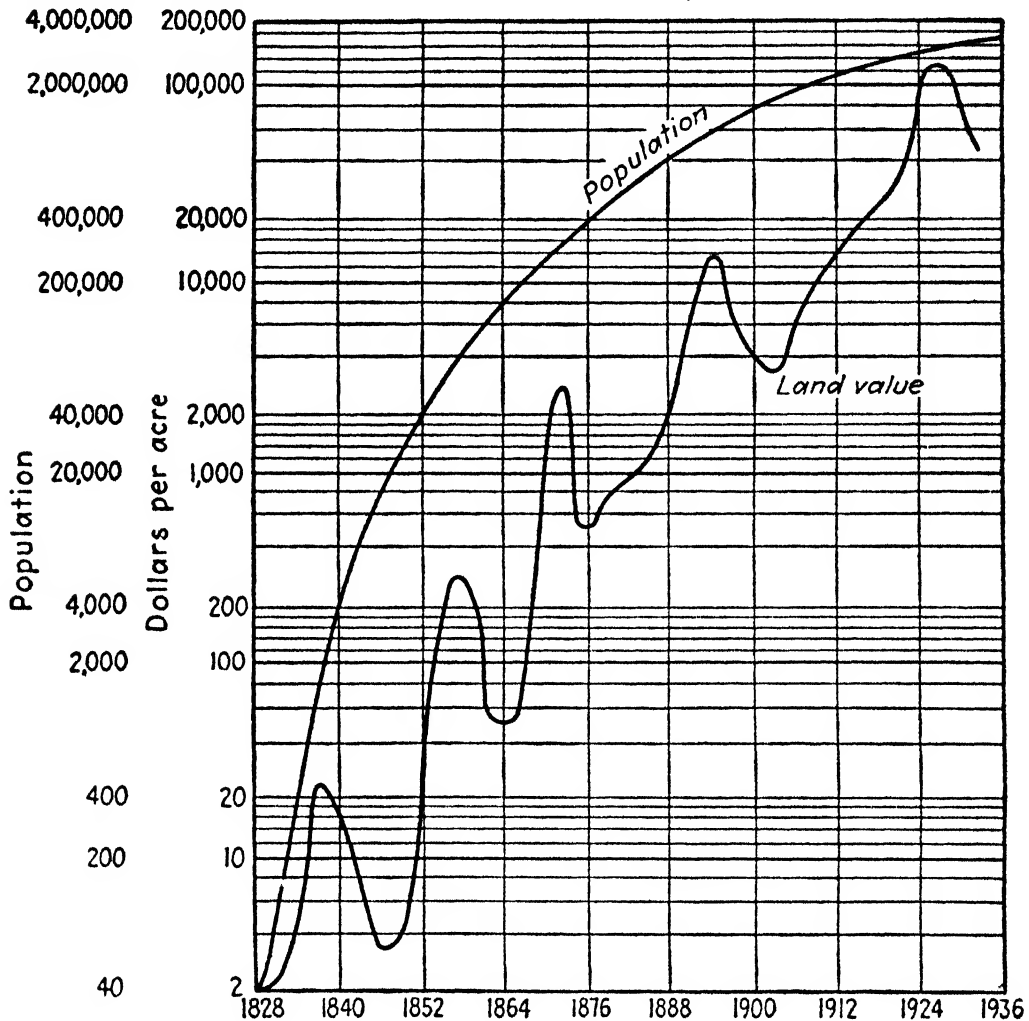


FIG. 43.—Growth of South Shore land value per acre, and urban population, in Chicago, 1828-1936.¹

Historical Example of Land Values.—In 1920 the urban land in cities over 30,000 population in the United States had a value of 25 billion dollars or 50 percent of the value of the farm land of the nation, but by 1926 farm value had dropped to 37 billion dollars while the value of urban land had risen by 100 percent.

¹ HOYT, HOMER: "One Hundred Years of Land Values in Chicago," University of Chicago Press, 1933, p. 306.

This great shift of values was due to a double set of causes. Farm values depreciated because of the return to agricultural pursuits by the belligerent nations, and the increase in value of urban land was due to the population growth and general prosperity of American industry.

The widest range in values is shown by urban land. In 1933, urban land values varied from \$1,000 to \$20,000,000 per acre, and cases are known where the range is from \$50 to \$10,000 a front foot within a distance of 200 feet.¹ A lot on State Street in the Chicago business district sold for \$4,030 in 1836 and was valued in 1931 at \$3,580,447. The growth of land values in the South Shore area of Chicago is shown in Fig. 43.

Corporate Bonds.—*Railroads* constitute a major industry of the nation. They represent an investment of approximately 26 billion dollars and have outstanding over 18 billion dollars in securities. For many years the railroads have been an important factor in our economic system. While there has been considerable change in our transportation system within the past few decades, railroads still are indispensable to the nation's economy.

For decades railroad companies were regarded as the soundest corporate investment. They had been comparatively stable, showed relatively good earnings, and were rated sound in most respects. In recent years, however, there has been a decided change. A large decrease in traffic, high operating ratio, heavy bonded debt, severe competition, and falling rates have seriously impaired the financial standing of the railroads. Earnings have been at a low ebb. For the period 1931 to 1937, Class I railways earned on the average less than 2 percent on their aggregate property investment. For the years 1931–1935 these railroads as a group failed to cover their fixed charges. In consequence a large amount of railroad securities are in default. In spite of the dark picture there are some high-grade railroad issues. The investor, however, should select investments only in the soundest companies, those able to meet their obligations throughout the depression.

Public utility investments represent the electric light and power, telephone, telegraph, gas, water, and electric railway companies. There has been a tremendous growth in this industry during the last two decades. There is at present a plant investment of over

¹ *Ibid.*, p. 2.

25 billion dollars in the industry with nearly as much outstanding in securities. The electric light and power industry has shown the most rapid growth in the utility group, followed by the telephone group. Electric railways are in the poorest position. Although there are some notable exceptions, the public utility companies as a group have a sound capital structure and a comparatively low operating ratio, *i.e.*, the proportion of gross earnings required to meet operating expenses and taxes. (Ordinarily, the operating ratio should not exceed 60 percent.) They have had a favorable trend in operating revenues which has been reflected in net earnings. A large number of companies in the electric, telephone, and gas industries have shown a good return on the invested capital and have amply covered their fixed charges.

The problem of investing in *industrial* bonds is particularly complicated because of the large number of companies and industries from which to choose. Each line of industry has its own peculiar problems and is subject not only to general economic conditions but to the vicissitudes of competition, management, price changes, and other factors. A large number of companies in this field are subject to extreme fluctuations in profits and losses, although some companies have comparatively stable earnings. The majority of industrial corporations have no bonds in their capital structure or at least only a nominal amount. Of some 9 billion dollars of industrial bonds outstanding, only those of a few dozen companies with excellent records are gilt-edged. Most of these companies are of outstanding importance in their respective industries.

In selecting gilt-edge bonds in the corporate field the investor should give careful consideration to the following factors:

1. *Territory.*—Public utility companies and railroads should operate in a territory which has ample resources, population, and business which afford large and growing service demands.

2. *Size.*—Size is an important factor since small enterprises as a class are more vulnerable than medium-sized or large ones. No set requirements regarding the size of a business are sure indicators of the quality of an investment. Nevertheless there is good evidence for setting up certain quantitative standards as guides in bond selection. Thus, the minimum size of a business should be approximately as follows: Railroads, 3 to 5 million dollars gross revenue; public utilities, 1 to 2 million dollars gross revenue; industrial companies, 2 to 4 million dollars gross revenue.

3. *Security*.—The terms set forth in a security should be carefully understood. Such items as lien position, foreclosure provisions, conditions affecting interest payments or dividends, protective provisions, priority of other securities, and so on, should be analyzed carefully.

4. *Record of Company*.—Any investment should be restricted to corporations having a fairly long record of successful operation and of financial stability. Securities of new companies or of companies which recently have had financial difficulties are not recommended.

5. *Earnings*.—Undoubtedly earning power is the most important test of an investment; it measures the real worth of an enterprise and determines the ability to meet its obligations. For public utility, railroad, and industrial corporations, earnings for a number of years should have averaged well in excess of interest requirements. The total fixed charges of utilities should be covered one and three-quarters times; railroads two times; industrials two to four times. These are minimum average figures which should prevail for a period of from 7 to 10 years. While these standards are higher than are usually specified, it is safer to be conservative.

In a study of the income of a corporation an attempt should be made to determine the *true* earnings figure. There are various devices by which earnings may be made to appear either larger or smaller than they really are. Thus a critical analysis of the income account should be made. Special attention should be given to non-recurring profit and loss items and to reserves.

In calculating how many times interest has been earned on a bond, the conservative method of determining a company's soundness is to calculate the number of times that *all* interest charges have been earned. A common practice pertaining to junior bonds and debenture bonds is to deduct the interest for the senior issues and then to show the number of times the junior or debenture bond interest has been earned. Such methods are quite misleading, for the results derived from calculating interest coverage in this manner frequently show that junior bonds or debenture bonds are better protected than the senior issues.

6. *Value of Property*.—With respect to equipment trust obligations and collateral trust bonds, soundness depends largely upon the value of the property on which the obligation is secured. Thus in purchasing these types of investments, the value of the pledged property should be carefully checked to make certain that it is ample.

7. *Stock Equity*.—In the case of railroad, public utility, and industrial bonds the market value of the preferred and common stocks should equal a substantial proportion of the total bonded debt of the enterprise. For a gilt-edge bond, conservative investment practice recommends that the market value of the preferred and common stocks should equal at least 50 percent of the bonded debt for public utilities, 65 percent in the case of railroads, and 100 percent in the case of industrials.

8. *Financial Condition*.—The financial condition of a company is a matter of considerable importance. The current-asset position is of particular importance in judging the soundness of an industrial enterprise. It is obtained by dividing the total current assets by the total current liabilities.

The current ratio varies considerably for different lines of business. Many of the better industrial corporations have a current ratio of at least 4 to 1.

Preferred Stocks.—The standards so far specified pertain to gilt-edge bonds. If one wishes to purchase very high-grade preferred stocks, the tests specified above should be more stringent. In general, as previously noted, preferred stocks are less sound than are bonds and mortgages. They cannot qualify as a high-grade investment unless interest charged on bonds (if any) plus preferred dividends are covered at least two to four times, depending upon the particular type of business.

Common Stocks.—There are many practical difficulties involved in choosing common stocks. The investor must be exceedingly cautious to avoid the pitfalls surrounding these securities. One should approach the problem with the full realization that common stocks in general are speculative instruments. In no case should they be purchased without first making a thorough analysis of the pertinent factors determining their value. The risk factor in common stocks makes it imperative to diversify one's portfolio. It is essential, in order to obtain average results, to protect one's self against unforeseeable future developments affecting individual commitments.

A thorough analysis should be made of the income account and balance sheet factors of the company whose stock is under consideration. An individual stock to qualify as a high-grade investment must meet rigid investment standards. The company must be sound financially. Earnings must be excellent and have been maintained over a sufficient period. There are some companies that have earned as an average better than 6 percent on the stockholders' equity for the past 10 or 15 years. Select only those companies which show substantial *true* earnings for a period of from 5 to 10 years.

Common stock *earnings* are quoted in newspapers and financial reports as so much per share after all expenses, taxes, fixed charges, and preferred dividends have been paid. Dividends are what the stockholder actually gets. In purchasing common stocks the cash-dividend policy is of major concern. The main purpose of a corporation from the investment standpoint is to pay dividends. Investment should be restricted to those companies with a well-established dividend record. There are a number of railroads, many more public utility companies, and scores of industrial

corporations which have paid a substantial cash dividend over a period of years. Many of these companies probably will give an excellent account of themselves during the next decade.

Common stocks must have high intrinsic value to justify them as an investment. The price paid for a stock should be governed by the earnings, cash dividend, and financial condition. A common stock selected from the investment standpoint should receive a cash dividend which will yield a larger return on the purchase price than can be derived from investing in gilt-edge bonds.

Common stocks fluctuate widely in price. This factor makes the question of "timing" very important in their selection. Proper timing will enable the investor to select a portfolio of stocks at reasonable prices. There is no definite rule or formula as to when stocks should be bought. It is doubtful if the price which one should pay for a stock should be more than fifteen times true earnings or twenty times the cash dividend as an average.

The Speculative Nature of Stocks.—The speculative nature of stocks can hardly be overemphasized. In the short period from June 18, 1928, to Sept. 3, 1929, the Dow-Jones¹ index of industrial common stock prices advanced from 202 to 381, a rise of 179 points, or nearly 84 percent! In a much shorter period of time, from Sept. 3, 1929, to Nov. 13, 1929—only a little over 2 months—the Dow-Jones index fell from 381 to 198, a decline of 182 points, or nearly 48 percent! The variations in the total market value and average prices of all listed stocks on the New York Exchange appear in Table 53. Note the tremendous decline in total market values from 1930 to 1933 and the recovery to 1937. Note, also, that the loss in stock values from 1937 to 1938 was greater than in any other year.

Investment Supervision.—To invest successfully is not an easy task. It means the study of many financial and economic problems and a choice between scores of different securities representing thousands of different business enterprises. Supervision of investments requires an answer to the question not only of how

¹ The Dow-Jones index of common stock prices, based upon thirty stocks, is printed on the financial page of many newspapers. There is also a Dow-Jones index of railroad stocks and one of public utility stocks. The Standard Statistics bond price indexes may also be found in many newspapers.

TABLE 53.—NUMBER OF SHARES, MARKET VALUES, AND AVERAGE PRICE OF STOCKS LISTED ON THE NEW YORK STOCK EXCHANGE, 1928-1938*

Year (as of Apr. 1)	Total shares listed	Total market values	Average price
1928	671,859,779	\$52,371,329,870	\$77.94
1929	862,725,570	69,770,122,189	80.87
1930	1,178,736,324	76,075,447,459	64.54
1931	1,298,492,276	53,336,394,495	41.08
1932	1,314,158,762	24,501,826,280	18.64
1933	1,292,601,719	19,914,893,399	15.41
1934	1,293,612,894	36,699,914,685	28.37
1935	1,303,680,865	30,936,100,491	23.73
1936	1,329,775,654	51,667,867,515	38.85
1937	1,380,281,474	62,467,777,302	45.26
1938	1,427,320,146	31,858,461,871	22.32

* *New York Stock Exchange Bulletin*, April, 1938.

to do it, but of who shall do it. The investor may carry on his own investment work or choose some agency to do it for him. The investor will need a great deal of training and experience to be his own counsel. The more important agencies which may perform this service are: Commercial banks, investment banks, New York Stock Exchange firms, investment departments of trust companies, and independent investment counselors or supervisory services. Some of the independent services providing investing assistance, particularly a few in the stock field, are of the racket type and their advice may be worse than useless.

The investment practice of the average investor will be haphazard and unsatisfactory unless he has clearly defined objectives. The individual investor should set up a financial program which will take care of the financial contingencies that he may have to face. Second, the investor should have a predetermined investment program to accomplish the financial objectives he has set, a program that gives consideration to the degree of risk he may assume and the types of securities that are suitable for his purpose. Such a program for the average investor comprises a reasonable amount of life insurance properly selected, a savings reserve fund, and high-grade security investments. The allocation of one's savings to these different fields will depend upon his position, needs, and requirements.

II. THE SECURITIES MARKETS

Need for a Continuous Market.—A continuous market is necessary in order to obtain liquidity of investment. Landowners often find it difficult to dispose of real estate without considerable loss, since the market for property is a discontinuous one in slack times. Thus it may be impossible to dispose of land promptly at a satisfactory price; the owner may be forced to wait several years to find a buyer who desires the property at anything but a forced-sale value. The owner of securities, on the other hand, usually finds that he may sell on a few minutes' notice at a price established in a market which is practically continuous. The price may not be so high as that which he would like to realize, but he need not fear inability to find buyers promptly at some price. Furthermore, the price in a continuous market usually changes by rather small steps; thus if he wishes to dispose of his property, the security holder may be able to do so before the price decline has become too great.

"Over-the-counter" Market.—A large proportion of bonds and many stocks are bought and sold "over-the-counter" instead of on regular security exchanges. The market for these securities is made by the dealers who specialize in buying and selling them. The supply at a given instant must seek a corresponding demand, or vice versa. Thus there may be a marked spread between the bid and asked prices for securities. Competition, however, may keep prices around a uniform level and the quotation spread within narrow limits. Such a market is far from continuous, but it is superior to the absence of any market whatever. Shares traded on such markets usually lack speculative interest, are of limited distribution among stockholders or from companies of small capitalization, or are not listed on organized exchanges for other reasons. Bonds, and particularly government issues, on the other hand, are traded in such markets in large volume. Altogether these markets deal in a larger number of issues, and handle about the same total volume of transactions, as do the organized exchanges.

The New York Stock Exchange.—The operation of organized security markets may be illustrated by an examination of the New York Stock Exchange, a voluntary non-profit association of stock brokers, which was organized in 1817. The exchange is

neither a partnership nor a corporation. The present membership is limited to 1,375. Membership is transferable on approval of the proper committee. The price of a "seat" or membership tends to fluctuate in terms of the amount of trading in the market; in 1914 a seat sold for as little as \$34,000 while seats brought as high as \$625,000 in 1929, the membership being 1,100 at that time.

The exchange has developed a remarkable mechanism by means of which a large volume of transactions may be handled promptly. Thus in the October crash in 1929 over 16,400,000 shares changed hands in one day. In order to understand the organization which handled 1 billion dollars of business in one day, we must examine the various types of members, the listing of securities, and the mechanics of trading.

Members of the Exchange.—There are two general types of members, active and inactive. Some members, such as the late John D. Rockefeller, are never active on the floor of the exchange but have other members execute orders at reduced commissions. The active members are divided into three classes, brokers, dealers, and a combination of broker and dealer. Brokers are of two types, commission and "two-dollar" brokers. Dealers are classified as floor traders and odd-lot men. The third class is made up of specialists who combine broker and dealer functions.

Commission brokers are the members of the exchange with whom an investor usually comes in contact. These men execute orders to buy or sell for persons not members of the exchange and charge a commission for their services. *Two-dollar brokers* operate only on the floor of the exchange. Their chief function is to assist commission brokers in the execution of orders; they act as agents of other brokers and receive a smaller commission.

Floor traders are individual speculators who concentrate on the stocks that are active at the moment. They seek to make a small but quick profit; thus they are in and out of the market at frequent intervals and often get out of the market entirely at the close of a day's business. Floor traders do not execute orders for customers but operate solely for their own account. The economic function of the floor trader is to eliminate wide fluctuations in prices from hour to hour and to keep the spread between bid and asked prices narrow. They also aid in making the market a continuous one.

Specialists are members who deal in only one or a few stocks. They may act as brokers and execute orders for other brokers on a commission basis, or they may buy and sell on their own account, hoping to make a profit. They stand at one "post" and attempt to make a continuous and active market for the stock or stocks in which they specialize. Their economic function is to keep fluctuations in prices small, to keep the spread between bid and asked prices small, to keep orders from piling up in the hands of other brokers, and to make a continuous market. A continuous market is one in which stocks can always be bought and sold on a moment's notice without a marked change in the price. Providing a continuous market is the most important economic function of the specialist.

Odd-lot dealers are members of the exchange who deal in less than 100-share lots. The unit of trading on the exchange is 100 shares, and fewer than 100 shares is called an "odd lot." The odd-lot dealers charge one-eighth of a point more, and give one-eighth less, than the going price, and it is from this spread that they seek to cover expenses and make a profit. The dealer may have shares on hand from which to fill orders, or he may sell stocks and later buy a block of 100 when his sales reach that figure. Thus he is forced to speculate on prices until his purchases balance his sales. The odd-lot dealer provides a service to the small investor at a price only slightly higher than that paid by the large investor.

Inactive members are those who seldom trade on the floor but who use their memberships to reduce the commissions they may pay. Business between members is done at rates as low as one-tenth those charged non-members. Rates depend upon the value of stock as well as upon the quantity. Thus commission brokers may receive over \$12 for handling a block of 100 shares of stock valued at more than \$125 per share.

Security Listing.—Securities may be listed for trading only if they meet the requirements of the exchange. No attempt is made to guarantee the value of the securities, but they must be issued by active corporations, they must be engraved so as to prevent counterfeiting, they must not be held by too small a group of persons, and the issuing corporation must agree to furnish certain information periodically. The company must establish separate registration and transfer agencies in New York City so

that change of ownership may be recorded properly. The Securities and Exchange Commission has laid down reasonably strict rules regarding listing which have been adopted by the New York Stock Exchange. Before a company may list a stock for trading it must get the consent of the commission as well as of the stock exchange.

Exchange Transactions.—The outright purchase of stock is the simplest type of transaction. Suppose Mr. Y decides to buy 100 shares of ABC common at the market price, which is about \$40 per share. If he lives in St. Louis he presents his order to the local broker's office to buy "at the market" or at a certain price. The order is wired to the New York office, telephoned to the exchange, and given to the partner of the New York firm who has a membership and is on the floor. The broker goes to the post (portion of the floor) where ABC stock is traded and asks the specialist for a price on the stock. The specialist may say "39 $\frac{7}{8}$ to 40," which means that he will buy the stock at 39 $\frac{7}{8}$ and sell it at 40. If the price is reasonably satisfactory, the broker will say "take it" and the transaction is consummated at 40. A memorandum is returned, via the New York office, to Mr. Y at the St. Louis office. Mr. Y then pays the broker \$4,000 plus commission, and receives the shares in due course. When the transfer of title has been accomplished through the proper agencies, Mr. Y will receive dividends when they are declared. He is the outright owner of the stock and may dispose of it as he wishes.

Margin Purchase.—If Mr. Y wishes to purchase as many shares as possible with the money he has available, he asks the broker to advance part of the purchase price and so operates "on margin." He must establish his credit with the broker by a deposit of securities or cash before the broker will permit margin trading, and the amount of trading allowed will be limited by the margin requirement. At the present time the margin requirement is 40 percent of the market price, regardless of whether the particular stock is selling at a high or a low price.¹ Thus if Mr. Y has \$4,000 available he may buy 250 shares of ABC stock at \$40, whereas he could buy only 100 shares outright.

Since the purchase price of 250 shares is \$10,000, Mr. Y's broker must find an additional \$6,000. He obtains this sum directly from a bank or indirectly from a bank through the loan

¹ Margin accounts under \$500 are not permitted by the SEC.

desk on the floor of the exchange, and deposits the shares of *ABC* as collateral for the *call loan*. The loan may be terminated at any time on 24 hours' notice by either the borrower or the lender. If the price of the stock should decline very much, the broker will demand additional margin to protect his liability on this loan; if the margin is not forthcoming, he will sell the stock and deduct the loss from the margin which Mr. *Y* has advanced.

If the price of the stock rises, Mr. *Y* may decide to take his profit. He orders his broker to sell 250 shares. Suppose the price is \$60 per share. The broker receives \$15,000, of which \$6,000 plus interest must be returned to the lender of the call money. Mr. *Y* receives the balance less two commissions and the federal and New York state taxes assessed against the seller. His profit, therefore, is \$5,000 minus these amounts. If he had purchased the stock outright for speculation, he could have operated with only 100 shares so that his profit would have been \$2,000 minus two commissions and taxes. On the other hand, a sharp drop in the price of stocks purchased on margin may result in a far greater loss than is possible with outright purchases.

Short Sale.—A speculator on the "short side" who believes that prices are due for a decline will give an order to his broker to sell a particular stock or stocks. Since he does not have these shares on hand, *i.e.*, he is "short" of them, the sale is called a "short sale." Not having the shares on hand, his broker is forced to borrow them to make delivery to the purchaser. Later, after the price has declined, he orders his broker to "buy in" an equivalent number of shares and deliver them to the lender of the stock. The difference between his sale price and purchase price, less commissions and taxes, is his profit.

The Stock Ticker.—The service which reports the prices of transactions on the floor of the exchange is said to have its origin in the demand of customers that they have some means of checking the honesty of brokers' operations. At present, however, the ticker service is important chiefly because it provides immediate information of price changes on the floor. Some 10,000 tickers are in operation in the United States and Canada. The transactions reported on the ticker tape are collected on the floor of the exchange by official reporters. Whenever a sale is completed a note of the stock, amount, and price is dispatched by pneumatic tube to the ticker room, where operators then put the

information on the wire. A series of symbols and abbreviations is used for each stock to facilitate handling the great flow of business.

The New York Bond Exchange.—The Bond Exchange is a division of the New York Stock Exchange, and is located in a separate trading room. It is not referred to as an exchange but as “the Bond Crowd.” The Bond Crowd is divided into four separate crowds:

1. The Active or Free Crowd
2. The “Cabinet” Crowd.
3. The Foreign Crowd.
4. The U. S. Government Securities Crowd.

Bidding and offering in all bonds are in $\frac{1}{8}$ ths, except in United States government securities, where quotations are in $\frac{1}{32}$ ds. The unit of trading in all bonds is one bond of \$1,000 par value—one \$1,000 bond or two \$500 bonds being a good delivery. Bids in bonds are made on the basis of percentage of par value. A bid of 98, therefore, means 98 percent of \$1,000 or \$980 (ten times the actual bid). Bonds sell at a price “and interest.” This means that the buyer pays the price named plus accrued interest from the last interest date. If a bond trades “flat,” it is usually in default of interest or is an income or adjustment bond.

Problems

134. “The investor does not need to invest in several corporations to obtain diversity of investments. Companies like General Motors and United States Steel in themselves provide a diversified investment. They have been formed from many companies and they engage in many lines of activity.” Do you agree? Why, or why not?

135. “The stock market should be abolished. It merely takes money from legitimate business. Speculation is wasted effort. It adds not a single pair of shoes, ton of steel, or can of beans to the nation’s supply of products.” Discuss.

136. Some investment counselors advise their clients to establish an “inflation hedge,” i.e., a combination of investments which would permit gains to balance losses in case prices were to double or treble, for example (see Chap. IX). Using a combination of life insurance (see Chap. XX), bonds, stocks, real estate, and other investments, formulate a plan of inflation hedge for an engineer forty years of age, earning \$4,500 a year. (Make any necessary assumptions, such as amount of savings, home ownership, living expenses, and so on.) What would probably happen to the total value of the investments if prices were to fall 50 percent?

137. Suppose a hundred years ago someone had bought a parcel of land for \$100 which today is worth \$100,000. What has been the total net appreciation in the value of the land if deductions be made for:

a. Compound interest (annual basis) at 4 percent, which might have been earned on the money in other investments?

b. Annual taxes averaging 2 percent of the annual value of \$100 appreciating at 4 percent compound interest?

(Make any necessary additional assumptions to complete the calculation.)

138. Using the following actual data for five corporations as criteria, what factors, in your judgment, determine stock prices? Do they agree with the text discussion?

Corporation	Market price of stock (Sept. 1, 1937)	Annual dividend (1936)	Rate of return, percent
Charis.....	\$12	\$ 1.50	12.5
Chrysler.....	97	12.00	12.4
Kroger.....	20	1.60	8.0
General Electric.....	48	1.50	3.1
Radio.....	10	0.00	0.0

References

BADGER, R. E., and H. G. GUTHMAN: "Investment Principles and Practices," rev. ed., Prentice-Hall, Inc., 1936.

BURTCHETT, F. F.: "Investments and Investment Policy," Longmans, Green & Co., 1938.

FLYNN, J. T.: "Security Speculation," Harcourt, Brace & Company, 1934.

GRAHAM, B., and D. L. DODD: "Security Analysis," McGraw-Hill Book Company, Inc., 1934.

HUEBNER, S. S.: "The Stock Market," D. Appleton-Century Company, Inc., 1934.

JORDAN, D. F.: "Jordan on Investments," 3d rev. ed., Prentice-Hall, Inc., 1934.

LIVERMORE, SHAW: "Investment Principles and Analysis," Business Publications, Inc., 1938.

RIDDLE, GILBERT: "The Investment Policy of Trust Institutions," Business Publications, Inc., 1934.

SHAFFNER, F. I.: "The Problem of Investment," John Wiley & Sons, Inc., 1936.

Twentieth Century Fund, Inc.: "The Security Markets," 1935.

WILLIS, H. P., and J. M. CHAPMAN: "Economics of Inflation," Columbia University Press, 1935.

CHAPTER XX

RISK AND RISK BEARING

Everyone is exposed to numerous risks every day of his life. Some of these risks are unavoidable, others are assumed by choice. Accident, disease, incapacity in old age, and premature death are risks associated with human existence. They are *personal* risks, as distinguished from risks to *property*, such as fire, wind-storm damage, and explosion. Other risks are present because of one's possible liability for injury to other persons or damage to the property of others. These *third-party* risks have increased greatly in recent years as the automobile and other agencies have brought people into closer contact with one another.

Methods of Reducing Risks.—Risk can be reduced to the degree that loss can be prevented. Thus a fireproof building can be constructed or an automatic sprinkler system can be placed in a building which is not fireproof. Guards may be installed on dangerous machinery and steam boilers may be inspected at regular intervals to reduce the possibility of explosion. The risk of disease can be reduced by the inspection of water and milk supplies and by inoculation against typhoid fever, smallpox, and other diseases. If a producer is able to secure a contract calling for the entire output of his plant or mine for a year in advance he is relieved from the risk of a price decline during that period. If a principal contractor can sublet part of a contract to a subcontractor, he can avoid the risk of a rise in the price of materials and labor costs. Manufacturers and farmers alike have found that risk can be reduced by diversified production. Thus the producer of beekeeping equipment may add candle making as a sideline and the grower of corn may devote part of his land to raising soybeans for commercial uses.

If 1,000 home owners sign an agreement that each will contribute \$10 to enable any member of the group to replace his home in event of total loss by fire, the risk assumed by each would be greatly reduced. This is done through the principle of *amalgama-*

tion. If the same group were to form a permanent organization and collect *premiums* in advance of anticipated losses they would have, in effect, a *mutual* insurance company. Many years ago individuals (underwriters), and later groups of individuals organized as joint-stock companies, saw the possibilities of specializing in risk bearing, and developed the institution of *insurance*, which has come to be the principal device through which risks of many kinds can be transferred to others at relatively small cost.

The Principle of Insurance.—A service that is common to all forms of insurance is the substitution of a small but certain payment for large and uncertain losses. This does not mean that all risk of loss from the occurrence of a given event is eliminated, but that the financial burden of the possible loss, should it occur, would be greatly reduced. It is the uncertainty to an individual of the possible occurrence of various events that introduces the element of risk. When a sufficient number of individuals are considered as a group, the probability of the occurrence is no longer uncertain; its probability becomes susceptible of mathematical measurement owing to the normal frequency distribution of cases according to the law of chance (Chap. III). Thus what is uncertain for any one individual becomes certain for a sufficiently large group, and so the cost of the expected losses can be apportioned among the members of the group in the form of insurance premiums. No one knows which member of the group will suffer the loss, but funds are thus available, in the form of small contributions from all members, to indemnify the unfortunate individual for at least a part of the expense of his losses.

Insurance as a Cost Factor.—People frequently think of insurance premiums as additional costs of production. Premiums are cost items, it is true, but insurance actually reduces the unit cost of production in most cases. For example, if corporations could not insure their buildings and products against certain contingencies, it would be necessary for them to set aside reserves for these contingencies greatly in excess of the amounts required for insurance premium payments. Moreover, the shifting of the protective function to another group of persons represents a gain in general efficiency because it is merely an extension of specialization and of the division of labor. Finally, insurance companies, through their preventive activities, are able to reduce certain hazards. In the field of automobile insurance, for exam-

ple, headlights, bumpers, locks, and other devices are subject to the approval of the underwriters.

Life Insurance.—The principle of loss-sharing by the cooperation of large numbers can be applied to the use of life insurance. The risk insured against is not that a certain loss will occur, but that the insured person will die within a particular interval of time. The importance of the death risk is seen in the fact that at the beginning of 1937 there were over 121 million life insurance policies in force in the United States with a total face value of over 104 billion dollars. The policies were widely distributed among all classes of the population, but the size of the individual policies and the amount of insurance carried varied greatly from person to person. Thus there were nearly 87 million small *industrial* policies, with an average face value of about \$225, and some 34 million *ordinary* policies with face values ranging from \$1,000 to \$100,000 dollars, a few running as high as a million dollars or over. There were also about 25,000 master group contracts providing life insurance protection for several million employees of companies using group insurance plans.

Types of Life Insurance Policies.—The many varieties of life insurance policies offered to the public may be reduced to a few basic types. These main types, together with their approximate annual cost (non-participating premiums) per thousand at age twenty, are shown in Table 54.

TABLE 54.—ANNUAL COST OF BASIC TYPES OF LIFE INSURANCE POLICIES

Type	Annual cost at age 20	
	Per thousand	Index (term = 100)
Term (10 years).....	\$ 8.33	100.0
Ordinary (whole) life.....	13.90	166.8
20-payment life.....	22.65	271.9
20-year endowment.....	42.89	514.8

The *term policy* is the only pure protection contract. Premiums are paid during the entire 10 years unless death occurs in the meantime. If the policy owner is living at the expiration of the period, the beneficiary receives nothing nor does the policy have cash and loan values. The insured has paid for and

received the same type of protection that he obtains in a fire insurance policy on his house or in his automobile liability policy.

An *ordinary life* policy combines investment with pure protection. The purchaser of this type pays premiums until his death. At death the beneficiary receives the face value of the policy. When premiums have been paid for a few years, this and the following policies have cash and loan values. The *20-payment* life form is merely a modification of the ordinary life policy. The difference is that only twenty annual premiums are paid unless death occurs meanwhile, after which the insurance company has the use of the funds until death necessitates the payment of the claim.

The *20-year endowment* policy has the highest premium of the four types because the insurance company not only agrees to give the beneficiary the face value of the policy, if the insured dies at any time within the 20-year period, but also agrees to give the face value of the policy to the insured himself if he is living at the end of the period. It is the same as asking a taxi driver to take you for a ride and to give you a dollar when you get there. He can do it by charging you \$1.50—50 cents for the ride, \$1 for the gift at the end of the ride. In other words, when a person buys endowment insurance he buys two things: protection against the financial hazards of death, and an investment.

Policy Dividends.—The premium rates quoted above are *net* rates; that is, the policies do not participate in the profits of the company. Policies issued by the “mutual” companies, and in some cases by stock companies, pay *dividends*. These dividends are paid from a surplus due to excess interest earnings, favorable mortality experience, and low operating costs. Participating premium rates are usually higher than non-participating rates which make possible a return of part of the premium in the form of a dividend. Usually the policyholder may draw the dividend in cash or apply it as part payment of any premium due; he may use it to purchase a paid-up *addition* to the policy payable at the same time as the face of the policy; or he may deposit the dividend with the company and draw interest thereon as on a savings bank account.

Rate of Return on Life Insurance Investment.—The purchaser of life insurance is interested in knowing the rate of return he may expect on the “investment” part of his policy. The

general method of computing the rate is to eliminate the "protection" cost and to compute the rate on the balance, as shown in Table 55.

TABLE 55.—NON-PARTICIPATING POLICY, \$1,000, AGE TWENTY

Item	10-year term	10-year endowment
Gross annual premium.....	\$8.33	\$ 94.62
Amount by which the endowment premium exceeds the term premium.....	.....	86.29
Cash value at the end of 10 years.....	0	1,000.00
Excess of cash value of endowment over term.....	.....	1,000.00

Thus $\$1,000.00/86.29 = \11.58 (excess cash value divided by excess premium). The problem is now one of determining at what

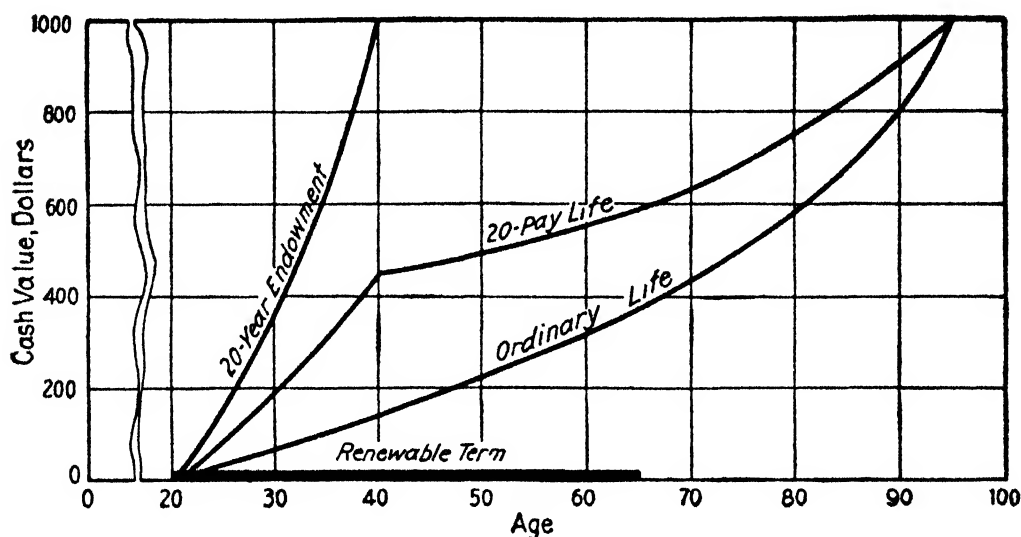


FIG. 44.—Comparative investments in life insurance policies. (Face value \$1,000.)

rate of compound interest \$1 per annum will amount to \$11.58 in 10 years. A compound interest table would show the rate to be a little less than $2\frac{3}{4}$ percent. The investment element in different types of policies, as represented by their cash values, may be compared by means of Fig. 44.

The Purpose of Insurance.—Life insurance is carried by most men for one of two reasons. If it is considered as an investment, it is carried to provide funds for retirement and old age; if it is

considered as pure protection, it is used to provide an immediate estate for dependents in case of death before the insured has had an opportunity to acquire wealth. No enlightened individual should require arguments to convince him of his need for insurance. Every man should carry some life insurance if he is an insurable risk. However, two questions remain to be answered: How much insurance should a man carry? What kind of insurance should be carried?

The Quantity of Insurance.—If possible, a man should purchase enough insurance to enable his family to retain its customary standards of living in the event of his untimely death. This amount is the same as the sum representing the economic value of a man. If a man thirty years of age has a work expectancy of 20 years in his particular occupation, and if his average annual wage is \$2,000, he would be expected to earn about \$40,000 in the future. His family, however, would not require that sum in his absence. Statisticians have estimated that in a family of three the father uses about 40 percent of the income. In larger families the proportion used by the father is less. In a family of five it probably would not be much over 30 percent. Thus if the man with a future earning capacity of \$40,000 has a wife and three children, at least \$28,000 may be needed to support them at their present standard of living in case of his death.

Funds should be available at least until the youngest child reaches his majority and it would be advisable to provide some additional income for the mother. Thus we wish to know the amount of insurance necessary to provide at least \$1,400 per year for 20 years. Roughly, it will require \$17,500. If the father had been earning \$3,000 per year, he would need \$26,000 of insurance to give his family their accustomed standard of living in case of his death. The amount of property owned, the ability of other members of the family to earn an income, the trend of living costs, and other factors modify these estimates of the amount of insurance required. As one grows older the need for protection, and hence for insurance, declines though it may never cease entirely. On the other hand, the young engineer would be likely to find that present earnings do not reflect accurately the trend of his future income, for he may anticipate a larger salary as his experience grows. Thus it might be advisable for him to carry more insurance than his present income seems to

justify. All these modifying factors can be cared for in a sound insurance program.

The Type of Insurance.—A young engineer may find it very difficult to carry \$17,500 of life insurance yet he may feel its need keenly. The annual cost of this amount of insurance under different types of non-participating policies would be approximately as follows:

Type	Annual premium (age 25)
Term (10-year).....	\$145
Ordinary life.....	267
20-payment life	419
20-year endowment.....	736

The young man buys insurance primarily for protection; he is but little concerned with retirement income and this latter phase of insurance will continue to be insignificant to him for a number of years. Therefore he should seek to obtain the maximum protection at the minimum cost. Clearly, term insurance provides the immediate solution of his problem. Twenty years later, however, the insured may find that his chief purpose in carrying insurance is to provide funds for old age. Term insurance is quite useless in this respect. In order to establish an insurance program that will satisfy these widely divergent purposes, we must understand two additional aspects of insurance policies.

Conversion, and Cash Surrender Value.—Since insurance policies are contracts, one policy may be converted into another only if both parties to the contract agree to the change. Anticipating requests for conversion, insurance companies sell term insurance with the *conversion* privilege. This fact is very significant for the young man, particularly one with young dependents. He may take out all the insurance he can afford to carry in the cheapest form available and he may convert part or all of it into any other form at any time during the conversion period, *i.e.*, usually 7 years on a 10-year contract, *without medical examination* or other requirements except the requisite change in premium rates. Pure protection may be acquired when most needed. It may be obtained in the cheapest possible form and may be converted at the insured's pleasure as his earning ability rises from year to year. No matter what disease he may contract, or what event

otherwise would render him non-insurable, he still may exercise the conversion privilege.

All policies except term insurance build up loan and cash surrender values year by year. The insured may borrow against the loan value of his policy, usually at 6 percent, or he may surrender the policy in exchange for the full loan value in cash. It is these cash values that were plotted in Fig. 44. They also are quite significant for the young man who wishes to design a life insurance program. When term insurance is to be converted into some other form, the need for protection is not over by any means. Though this need for protection is still strong, the alternate requirement of future income is beginning to appear. These two purposes now may be combined.

The Insurance Program.—Should conversion from term insurance to some other form be to an ordinary life policy or to an investment-type policy, such as a 20-year endowment? Clearly, if the need for protection is still great, the conversion should be to the policy which gives the greater protection. If the young man can afford to pay, for example, \$400 per year for insurance when he decides to convert his term insurance, he could carry about \$9,500 of 20-year endowment coverage. If he elects to take ordinary life instead, however, he could carry some \$23,000 at the same cost provided, of course, he has at least that much term coverage from which to make the conversion.

If the conversion privilege is exercised at the age of thirty, let us say, 20-year endowment insurance could be arranged to mature at age forty-five or fifty.¹ If the endowment matures at age fifty, the insured, if still living, will receive \$9,500. The cash surrender value of the \$23,000 of ordinary life taken out at age thirty, however, would be only about \$5,775. If the insured were not concerned about a retirement income he might use the \$9,500 to build a home or to make a business investment. If he were concerned about his retirement he might purchase a lump-

¹ The insured may choose whether he will begin the endowment (or other) insurance at the conversion date, in which case he pays premiums on the basis of the attained age, or whether he will begin the new insurance at the date he took out the term policy, in which case he owes the insurance company an amount equal to the *difference* between the premiums paid and those required, plus interest. The latter method allows a lower premium rate, but requires a lump-sum payment which may be large.

sum *deferred annuity* which, beginning at age sixty-five, would provide him with an annual income of nearly \$1,400 as long as he lives. Or he might purchase a smaller (about 17 per cent) *refund annuity* which would continue the payments to designated beneficiaries in case he died before the total annuity payments equaled the principal sum.

Instead of buying term insurance with the idea of converting it later to the more expensive investment insurance, one might buy term insurance for the entire period of life during which protection is needed and might invest the premium savings in a separate account. This investment might take the form of a savings bank account, United States bonds, or a deferred annuity, all conservative investments with about the same income possibilities. Table 56 shows the advantages and disadvantages of buying term insurance and "investing the difference" (Plan A), as compared with buying an investment policy alone (Plan B). The total annual cost (\$23.25) is the same in each plan, but in Plan A \$12.08 was invested annually in a deferred annuity.

TABLE 56.—COMPARISON OF A COMBINATION TERM EXPECTANCY POLICY* AND A DEFERRED ANNUITY WITH A RETIREMENT INCOME POLICY† AT AGE SIXTY-FIVE
(Age twenty-five: Amount of Insurance \$1,000)

Kind of policy	Annual premium	Results at age:					
		45		64		65	
		Death value	Cash‡ value	Death value	Cash‡ value	Death value	Cash‡ value
Plan A							
Term expectancy..	\$11.17	\$1,000	\$ 75	\$1,000	0	0	0
Deferred annuity..	12.08	310	310	897	\$ 897	\$ 940	\$ 940
Plan A total....	\$23.25	\$1,310	\$ 385	\$1,897	\$ 897	\$ 940	\$ 940
Plan B							
Retirement income at age 65.....	\$23.25	\$1,000	\$ 398	\$1,330	\$1,330	\$1,377	\$1,377

* Expires in 38.81 years—the average future lifetime of a person twenty-five years of age according to the American Experience Table of Mortality.

† Policy expires at age sixty-five and retirement income begins.

‡ The amount of cash the insured would receive if he "cashed in" his insurance—accepted the money and relieved the insurance company of all further responsibility in the event of his death.

These accumulations as well as the savings in the retirement income policy (Plan *B*) are expressed as *cash* values for three different years. If one died at age forty-five or sixty-four, or at any other age before sixty-five, his dependents would receive more under Plan *A* than under Plan *B*; if one desired to take the cash value, however, Plan *B* is preferable to Plan *A*.

Regardless of the types of insurance carried, the proceeds of insurance policies should be paid in ways which will best serve the dependents. Except for purposes of paying funeral expenses, retiring a mortgage on the house, and similar needs, cash or "lump-sum" payments are not so advisable as monthly or semi-monthly installments. The period of time during which these payments should continue must be governed by individual needs, in some cases for a lifetime.

Industrial Life Insurance.—Industrial insurance comprises about 18 billion dollars of the total life insurance in force in the United States. It differs from other insurance in that premiums are payable weekly to an agent of the company at the insured's home, and the insurance may be purchased without medical examination. The policy provisions in these contracts are more restricted than in ordinary policies. Whereas ordinary insurance provides cash and loan values at the end of the second or third year, such values generally are not available to the industrial policyholder until the end of the fifth year. Industrial policies cost more than ordinary policies, and compose the weak link in the American insurance system.

Group Life Insurance.—Group insurance is of comparatively recent origin and may be defined as the coverage of a number of individuals by means of a single "master" policy. The most common form is 1-year renewable term life insurance, though accident and health insurance and old-age retirement insurance are also sold under group contracts. A group ordinarily must contain at least fifty members and their common employer must be responsible for paying the premiums. Sometimes the employer pays the entire premium. When, however, the premium is to be paid by the employer and employee jointly and the benefits of the policy are offered to all eligible employees, at least 75 per cent of such employees must be so insured.

Group insurance offers distinct advantages to employees. It is usually sold without medical examination. If for *any* reason

the insured worker leaves the employ of the company which has covered him with a group insurance plan, he may, within 30 days and without medical examination, obtain permanent insurance at the premium rate applicable to the age attained at termination of service. If employment is temporarily suspended because of sickness, layoff, or other similar reasons, the insurance will remain in force if the employer continues payment of the premium. Even when the employee pays a part of the premium cost, group insurance gives protection at very low cost, especially to workers who are above forty years of age.

Disability and Accident Insurance.—Life insurance protects one's dependents from poverty and suffering after one's death, but the person who is incapacitated and is therefore unable to earn a livelihood also has need of insurance, for the financial hardships in such a case may be much worse than those resulting from death. He may obtain *total disability* protection in conjunction with his life insurance policy by the payment of an additional premium. The disability clause usually provides that in case he is totally incapacitated for work for at least six months, he may obtain \$5 monthly benefits on each \$1,000 of his insurance coverage. Moreover, he will not be required to pay premiums during the period of disability. A type of disability protection can also be obtained by the "waiver of premium" provision which may be purchased with a life insurance policy. This clause provides that premiums will be paid by the insurance company if one becomes totally disabled.

Protection for *partial disability* may be obtained to the best advantage through the purchase of an accident policy which, however, pays no indemnity for death resulting from natural causes. A more complete though more expensive form of protection is a non-cancelable accident and health policy which indemnifies the insured for loss of time through accident or sickness. Either form is a valuable and desirable supplement to a life insurance policy, for much of the poverty in the United States is said to be due to loss of income arising from accident or ill-health.

Fire Insurance.—Fire insurance policies provide for indemnification for the amount of direct loss or damage by fire, or damage by removal of goods from premises endangered by fire, providing the loss is not greater than the face value of the policy. The

indemnification, however, need not be a cash payment, since insurance companies reserve the right to repair or replace the damaged articles. Rates depend on many factors, the more important of which are *location* as to state, city, and district, type of *construction*, and *moral risk*. Thus losses in some states are consistently greater than in others, some cotton mills are less hazardous than others, and churches as a group are better risks than cotton mills as a group. The American fire loss per capita was \$2.08 in 1934 and had been more than twice that amount in 1930.

Fire insurance is dependent upon engineering services in three fundamental respects. First, engineers play an important part in the work of fire prevention. Second, engineers make the necessary inspections without which it would be impossible scientifically to determine fire insurance premiums. Third, engineers give useful service in the adjusting of fire insurance claims, particularly where large amounts of expensive machinery and equipment are involved.

Automobile Insurance.—In order to obtain complete protection an automobile owner should have five types of insurance coverage. *Personal liability* coverage offers indemnity against liability for damages because of bodily injury to others arising out of the ownership, maintenance, or use of an automobile. This coverage also provides that the company will pay the legal costs of defending the insured in a liability suit, as well as other costs relating to the investigation and settlement of claims. The insurance company's liability generally is limited to \$5,000 for injuries to or death of any one person, and \$10,000 for more than one person in any one accident, although larger coverage may be obtained at a small additional cost. *Property damage liability* covers the assured's legal liability for damages because of accidental injury to property resulting from the ownership, maintenance, or use of an automobile, subject to conditions specified in the policy. Rates for both personal and property coverage depend upon the territory in which the car is to be used, the type and price class of the car, and the use to which it is put. *Collision insurance* provides indemnity for loss or damage sustained by collision of the insured's car with moving or stationary objects. This form of insurance is not widely carried because it is expensive and because its absence harms no one but the owner

and then to an extent limited by the amount of his own car's damage.

Fire insurance for automobiles introduces no new points. The factors involved in the fixing of the premium rate are the construction of the car, the existence of such protective devices as fire extinguishers, and the use that is to be made of the car. *Theft insurance*, usually written by an endorsement on the fire insurance form, is designed to cover the loss of property by theft. Rates are based upon the territory of operation and upon the list price of the car, high rates being charged for the cheaper cars because of their greater susceptibility to theft and disposal. The ratio of losses to premiums in 1934 for these forms of insurance was: Liability, 68.7 percent; property damage, 44.5 percent; collision, 58.5 percent; and fire and theft, 34.1 percent.

Hedging.—A means of securing protection against market contingencies is available in the case of the staple commodities handled on organized exchanges. Here *future trading* and *hedging* are common and very important. In future trading, payment and delivery are postponed to a future time, for the commodities may not even be in existence at the time the contract is made. Thus a future contract is an *agreement to sell* and not a consummated sale. Many of these contracts may be canceled eventually by the settlement of price differences through "clearinghouses," for traders who use future contracts for hedging purposes usually do not desire delivery of the commodity involved in the agreement.

Hedging is the practice of entering simultaneously into two contracts of an opposite though corresponding nature. One is in the trade or "spot" market, while the other is in the "future" or speculative market. The contracts are opposite in nature in that one involves a purchase and the other a sale, but they correspond in regard to the amount of the commodity involved. The purpose of hedging is to protect the *trade profit* arising from the performance of manufacturing or marketing functions on the part of the hedger. To secure the maximum protection through hedging, the existence of a nearly parallel movement in spot and future prices must be assumed. This means that the future price should exceed the spot price only to the amount of the carrying charges (expenses of storage, interest, insurance, and physical handling of the commodity). Some of the products

subject to hedging on organized exchanges are wheat, rye, oats, corn, rice, hay, flaxseed, cotton, coffee, sugar, grass seed, butter, eggs, some pork products, cottonseed oil, tin, copper, spelter, zinc, and lead.¹

Problems

139. Explain the general method by which a life insurance company would determine the amount of the annual premium a policyholder would have to pay for a 30-year endowment policy.

140. Examine your own insurance policy or policies. What provision is made in case you do not pay your premiums as they come due? Do you have any choice in regard to these provisions? If so, how would you determine which choice to take?

141. Anticipate your probable needs and financial status over the next 20 years and on this basis work out your own insurance program, *i.e.*, how much and what kinds of insurance you will buy, when you will buy it, to whom the insurance will be payable, and so on.

142. "Every motorist should be required by law to carry automobile liability insurance." Do you agree? Why, or why not?

References

APPLEMAN, EARL: "Inland Marine Insurance," McGraw-Hill Book Company, Inc., 1934.

DUBLIN, J. I., and A. J. LOTKA: "The Money Value of a Man," Ronald Press Company, 1930.

HARDY, C. O.: "Risk and Risk Bearing," rev. ed., University of Chicago Press, 1933.

HUEBNER, S. S.: "Property Insurance," D. Appleton-Century Company, Inc., 1933.

———: "Life Insurance," D. Appleton-Century Company, Inc., 1935.

MACLEAN, J. B.: "Life Insurance," McGraw-Hill Book Company, Inc., 1935.

MAGEE, J. H.: "General Insurance," Business Publications, Inc., 1936.

MOWBRAY, ALBERT H.: "Insurance, Its Theory and Practice in the United States," McGraw-Hill Book Company, Inc., 1937.

WILLETT, A. H.: "The Economic Theory of Risk and Insurance," Columbia University Press, 1901.

¹ For a more detailed discussion of hedging see Maynard, Weidler, and Beckman, "Principles of Marketing," Chap. XXIV.

CHAPTER XXI

THE BUSINESS CYCLE

The problem of the business cycle is the leading economic issue of the day. More people are affected by it, more economists and business leaders are studying it, and greater differences of opinion are held concerning it, than is true of almost any other single problem or group of problems in economics. While other economic problems seriously affect only a part of the population, or affect the whole population only to a limited degree, the problem of the business cycle affects everyone—workers and capitalists, storekeepers and farmers, manufacturers and professional groups. No one completely escapes its good or bad effects.

Periodically our economic system presents the spectacle of unemployed persons who are able and willing to work but can find no jobs; who are anxious to purchase goods but have no money. At the same time, idle tools, machinery, and equipment of all sorts are waiting to be used. Raw materials and finished goods are available or could be produced in large quantities. Banks are in a position to extend abundant credit. Curiously enough, millions of men, women, and children simultaneously are in dire need of the clothing, food, shelter, and other commodities that might be made from these materials, with these machines, by these unemployed consumers; yet production does not take place.

The extent of the economic loss which results from these recurrent periods of business stagnation is enormous. It is reflected not only in loss of wages and income on investments but also—what is even worse—in the economic demoralization of people in all walks of life. Even when the “will to work” remains, the ability to work efficiently often is impaired seriously by the rigors of a reduced standard of living necessitated by the loss of employment and income.

What is the nature of these periodic stagnations? Why do they occur? Can they be reduced or eliminated, or must they

be accepted as one of the inherent evils of our capitalistic system of production? Few more significant questions face mankind today.

Business Fluctuations.—Business seldom runs along an even plane but most of the time is fluctuating either upward or downward. If an index based upon sensitive data is used, such as the New York Times Weekly Business Index, the week-to-week fluctuations are plainly discernible. If weekly or monthly fluctuations are combined for yearly averages, and these in turn are plotted over a period of years, long-run trends unfold.¹ Within the long-run trends and embracing the short-run fluctuations are wavelike movements of business whose oscillations up and down have been found to be sufficiently regular to merit the designation "cycle." In reality there is not one cycle, but there are many cycles and they are not all synchronous. There are cycles of prices, production, employment, business failures, and many other component parts which together make up the economic cycle or, as it is commonly stated, the business cycle.

A "Composite" Cycle.—In order to understand the "inner working" of cyclical fluctuations, a *composite* cycle will be explained. It is a "normal" cycle, and therefore does not represent any one actual situation exactly, though it is built up from a series of such occurrences. Business cycles frequently are divided into four phases, as shown in Fig. 45. Of these, *prosperity* and its antithesis, *depression*, each may continue for a considerable period; *recovery* is of moderate length; and *recession* is ordinarily of but brief duration. In the present industrial system, it is very significant that each phase of the cycle is *just as normal* as is any other phase.

Prosperity (A to B).—The terms "prosperity" and "good business" are synonymous for most people. Good business means high profits. It is the factors which lead to business profits that characterize the prosperity phase of the business cycle. Profits may result from an increased volume of business, rising prices, falling costs, or some combination of the three. In the prosperity phase, the volume of business expands and the prices of finished goods and of raw materials rise. Costs seldom fall, but usually they do not rise so fast as prices in the early phase of prosperity. This slower rise results in a temporary increase in

¹ Cf. Wholesale price index, p. 161.

profits. Costs tend to lag behind prices for a number of reasons. Bank credit is abundant and credit policies are "easy;" wages are slow to change, since there are unemployed persons who must be put back to work before the supply of labor becomes short in relation to the increased demand for it; many companies stock up on raw materials at low prices during the depression and early recovery period and hence are able to show inventory profits as well as manufacturing profits. The increased profitability of business induces businessmen to expand their plants. In so doing they stimulate the capital-goods industries and put more

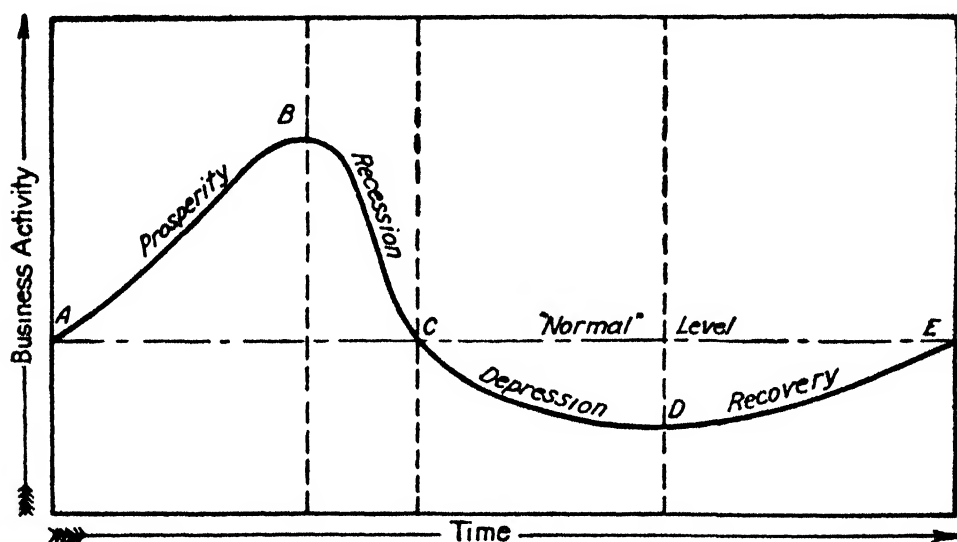


FIG. 45.—The business cycle: generalized form.

people back to work. These workers now have more money to spend and tend to make business even better. The result is a spiral of rising prices and increasing business activity, with costs lagging behind.

Crisis and Recession (B to C).—Any factor or factors which give the businessman grounds for believing that his profits will be reduced tend to make him more cautious and may lead him to contract his output. The high profits of the early prosperity phase are due in part to the discrepancy between costs and prices. When costs begin to move up, profits are diminished somewhat. Wages increase as the unemployed go back to work and the supply of labor in some lines becomes short relative to the demand for it. Interest rates rise when the banks have expanded credit to the point where excess reserves are low. Prices of raw materials

also rise. During the prosperity period labor sometimes becomes less efficient and management becomes careless. Jobs are easy to get and profits easy to make. All these factors tend to reduce the spread between costs and prices and so reduce profits. In certain cases goods cannot be sold at prices which will cover their costs and yield a profit. Production is curtailed in these firms. The fact that production is curtailed means that the expenditures for wages and materials are reduced. The incomes of some wage earners and raw-material producers fall and they are able to buy less. The whole tendency to reduce the volume of production brings with it a reduction in purchasing power of consumers and tends to start the spiral of reduced prices, reduced

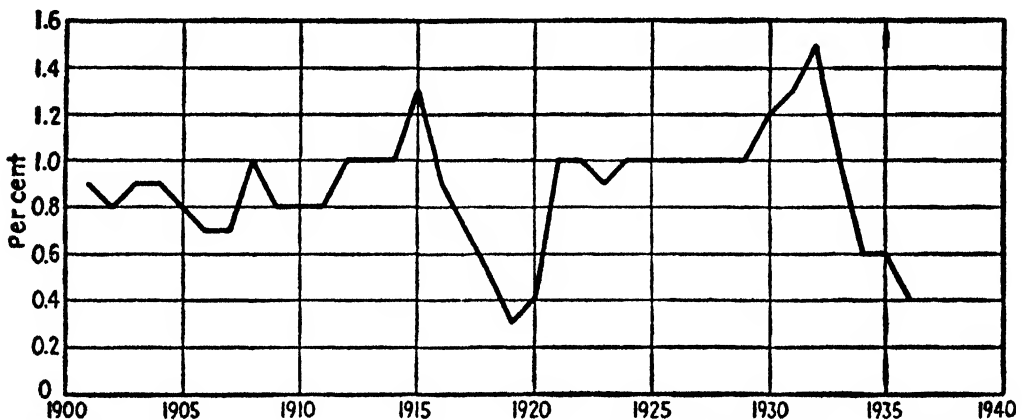


FIG. 46.—Percentage of total number of concerns in business failing annually in the United States, 1901-1936.¹

employment, and reduced output. The actual crisis, such as the stock-market crash of 1929, may be the result of a crash in prices built up on speculation. The very fact of speculation, however, indicates the existence of conditions which could not be maintained indefinitely.

Depression (C to D).—During the period of depression the readjustments begun during the crisis period are continued, but usually at a slower rate. Prices and costs continue to fall, credit is "tight" because of uncertainty regarding the future, unemployment is widespread, plants close down or operate on part time, and business in general is slow. During this period the maladjustments between costs and prices which occurred during the prosperity phase must be eliminated and a new balance

¹ "Statistical Abstract of the United States," 1937, p. 291. (Last three years include only commercial failures.)

attained. This step is accomplished by reducing prices of finished goods, inventory values, wages and salaries, and interest charges. Even after these costs are reduced there are still obstacles to recovery. Interest rates, for example, may be quite low but the credit tests for borrowing may be higher than before, with the result that loan expansion proceeds slowly. Top-heavy capital structures may be written down to bring prices and costs into adjustment, but this takes time and may not be done until it is forced by bankruptcy. All these changes are painful and prolonged, but necessary for recovery. When a new balance between prices and costs is attained, the way is clear for a revival of business if only the necessary stimulus be forthcoming.

Recovery (D to E).—What furnishes the necessary stimulus for recovery is a matter of uncertainty. The stimulus may be due in part to the fact that people feel the system is "sound" once again and are confident that it can go ahead for a while—the psychology of both buyers and sellers changes. Buyers no longer feel prices will fall, so they do not delay less urgent purchases any longer. Sellers no longer feel costs and prices will fall, and so they are willing to accumulate stocks in anticipation of demand. This change in psychology releases a considerable demand for goods. During the depression period people postpone a great many expenditures for durable goods, such as repairs on houses, new houses to take care of the increase in population, necessary clothing and house furnishing, and replacement of automobiles and electrical appliances. Once the future seems reasonably certain, this demand for replacement and expansion becomes effective and people start to buy again.

A second factor which may stimulate business revival is some unforeseen event such as a major war or large-scale crop failures in other parts of the world. A third way in which business may be revived is through the development of a new industry. The railroads after the depression of the seventies and the motor industry after 1920 provided much of the necessary stimulus for business.

In recent years, increasing emphasis has been given to the role of the government in stimulating business revival. A great deal of the current writing on the business cycle emphasizes the need for government spending as a means of "priming the pump."

The source of the funds to be expended by the government has a vital relation to the effectiveness of the program. If the funds result from higher taxes, new purchasing power is not created and no "priming" may occur. If the printing press is used to create new money, the experiment may become subject to the very real danger of runaway inflation. If the funds result from an increase in the national debt when the government borrows

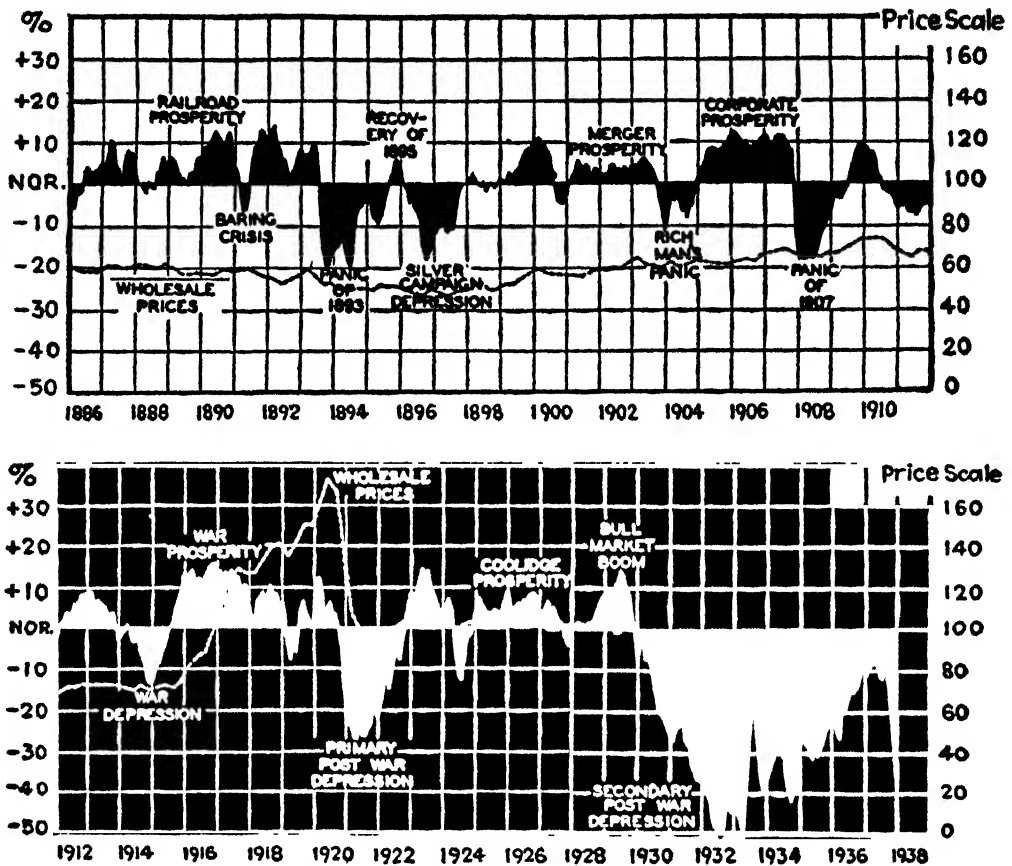


FIG. 47.—Business activity in the United States, 1881-1938.

from the banks—as was the case in 1933-1937—the circular flow of money may not be increased materially since the funds, when expended, may come to rest again in the banking system, thus requiring an ever-increasing national debt to prevent the pump from running dry entirely.

The Composite Cycle Compared with Actual Cycles.—Three main points of difference may be noted when the composite cycle is compared with actual cycles during more than a half century of business fluctuations in the United States. Figure 47 presents a chart of wholesale prices and of business cycles in the

United States from 1881 to 1938, based upon an index of "general business activity compared with normal operation."

The time elapsing between the occurrence of a given stage in one cycle and the recurrence of the same stage in the next cycle is subject to great variation. Four years has been estimated as about the average length of a cycle, though individual cycles have varied from 1 to 9 years in length. Prosperity tends to last longer than depression when wholesale prices evidence a rising secular trend and vice versa, while the very long cycles have been due to the prolongation more of depression than of prosperity.

Various lines of business are affected differently by cyclical fluctuations. Generally speaking, the durable goods industries suffer a far greater curtailment than the non-durable goods industries.¹ In the 1929-1932 decline, for example, the index of production in the iron and steel industry made a much greater

TABLE 57.—INDEX OF PRODUCTION IN SELECTED MANUFACTURING GROUPS
(Monthly series adjusted for seasonal variations, 1923-1925 = 100)*

Year	All industries	Petroleum refining	Tobacco products	Construction contracts (value)	Iron and steel
1929	119	168	134	117	130
1930	95	161	131	92	94
1931	80	155	123	63	60
1932	63	140	111	28	31
1933	76	145	116	25	53

* *Twentieth Annual Report*, The Federal Reserve Board, p. 242.

drop, than in the tobacco-products industry, and construction contracts awarded fell off much more than production in the petroleum-refining industry.

In the decline beginning in the spring of 1937, the index of iron and steel production dropped from 134 in May to 49 in December of that year; the index of tobacco-products production increased from 155 in May to 170 in December of 1937. Construction awards, stimulated by government-initiated projects, fell off

¹ Cf. Chap. XXIV for unemployment in the durable and non-durable goods industries.

much less rapidly than in the preceding decline, the index number diminishing from 68 in May to 49 in December, 1937.

The cycles themselves differ in intensity not only between different parts of the country but also between different groups of persons. Cycles may start in financial centers or in agricultural regions; they may affect the stock market or the nation as a whole. Thus the cycle of 1900–1904 contained the peculiar “rich man’s panic” of 1903, which affected the financial circles severely but seemingly passed over business of other sorts. On the other hand, the cycle of 1904–1908 answers very well to the generalized conception of cyclical movements presented above. Business made a fine recovery from 1904 to 1905, maintained a high pitch of prosperity for about 2 years, passed through a severe crisis and recession in 1907, and plunged into a new depression in 1908.

Theories of the Business Cycle.—A wide range of theories has been put forward in the attempt to explain business cycles. Many of them seek to confine the cause of these fluctuations to a single item and thus are guilty of oversimplification, for the problem is a highly complex one. Business cycle theories may be classified as follows for the sake of simplicity:

A. Those based upon *physical* processes: theories in which weather changes and other non-business factors are basic.

B. Those based upon *psychological* processes: theories in which recurring waves of optimism and pessimism are basic.

C. Those based upon *institutional* processes: theories in which cycles arise from:

1. The jerky nature of general social progress.
2. The lack of equilibrium in the process of disbursing and spending incomes and of producing goods at a profit.
3. The lack of equilibrium in the process of producing and consuming the goods themselves, rather than the incomes and expenditures involved.
4. The lack of equilibrium in the process of consuming, saving, and investing capital in new construction.
5. The financial processes of our banking system, such as the overextension of credit in prosperous periods and severe curtailment of credit in periods of recession.

Although the individual theories listed above under the general head of institutional processes have been advanced as separate explanations of the business cycle, most economists now believe that each is a partial explanation, but that no one alone offers a

true picture of the business cycle. The theory which attributes the cycle to the jerky nature of social progress explains in part the emergence from the depression of the seventies and the depression of the early twenties. The development of the railroads in the first case, and of the automobile in the second, were not followed in regular order by industries which could carry on when the market had been fairly well satiated. The result was a depression. This explanation is true in part but is far from complete.

The remaining four theories, which relate to a lack of equilibrium in the processes of disbursing and spending incomes and of producing goods, receive the most attention at the present time. On the spending side, the economic system should function with considerable stability so long as all consumers' income is spent for goods and services and all producers' income is spent for the services of the factors of production. If there is a considerable lag, however, between the time consumers receive income and the time they spend it for consumers' goods, the equilibrium may be upset and forces set in motion which bring on depression. Similarly, a lag in the disbursement of funds by producers may lead to depression.

The theory that the cycle results from a lack of equilibrium in the process of producing and consuming the goods themselves, rather than the incomes and expenditures involved, is what is commonly known as the overproduction theory. This theory does not hold that there is overproduction of *all* goods, but only of certain goods. Through errors in judgment and inability to predict demand, certain industries expand too rapidly and as a result are unable to sell their output at prices which will cover costs and yield a profit. Therefore they are forced to retrench, and thus initiate a depression. Presumably this situation exists because the other industries did not expand enough so that balance could be maintained.

The assumption that the cycle results from lack of equilibrium in the processes of consuming, saving, and investing capital in new construction is connected rather closely with the two preceding theories. According to this explanation, funds are accumulated during the latter part of the recovery period and the early part of prosperity. These funds are invested in capital goods for the expansion of output. During the first period of construction of capital goods, prices rise still higher because the

workers in the capital-goods industries have more money to spend. The result is an increased demand for consumers' goods and a further expansion of production. Eventually, however, more goods come on the market than can be absorbed at prices which cover costs and yield a profit. The result is a decline in prices, in production, and in employment.

According to the last theory, the cycle is attributable to the financial processes of our banking system. During the recovery period and early part of prosperity, excess bank reserves are large and credit is easy to obtain. Production is abnormally stimulated through the resulting high prices. Prosperity can continue as long as the supply of credit can be increased. Credit can be expanded only to the limit of reserves, however. When this limit is reached, the expansion of business must stop because further funds are not available. The result is a period of liquidation and unemployment. When a new adjustment between costs and prices again is reached, business will be ready to expand once more. During the period of liquidation and adjustment, businessmen pay back their loans and the banks again acquire excess reserves with which to finance a new boom.

All these theories contain some measure of truth, but no one alone adequately explains the business cycle. Many writers on the business cycle now are attempting to combine several of these theories so as to obtain an explanation which is more in accord with the facts and which will permit better analysis of measures designed to alleviate the severity of the cycle. In this approach, the psychological aspects of the cycle problem are receiving increasing attention. It is coming to be recognized that business activity, to some extent at least, is a function of the state of mind of businessmen. If businessmen feel optimistic, they expand production; but if they feel pessimistic, they contract production and are cautious in making commitments, particularly in respect to new investments. As was pointed out in the discussion of the phases of the business cycle, and especially with regard to the recovery phase, a feeling of confidence in the future leads to a revival of demand. This feeling of confidence, however, is not a random occurrence, but is a result of a belief that costs and prices are again in balance and that the general business situation is sound. If this belief is shared by the purchasers of securities on the organized exchanges,

the resulting buying of securities will raise the market and still further bolster public confidence. On the other hand, a sharp decline in security prices, whether justified or not by fundamental economic conditions, may encourage the downward trend of the cycle or delay its recovery.

International Aspects of Business Cycles.—An additional variable, which further complicates the cycle problem, is to be found in the fact that no country is isolated from the rest of the world. The marked degree of similarity in the business fluctuations of many countries indicates that there is a tendency toward the synchronization of the various phases of business cycles in different nations. Thus, as may be seen in Table 58, the low point

TABLE 58.—INDEX NUMBERS OF INDUSTRIAL PRODUCTION IN LEADING COUNTRIES*

Year	United States	Great Britain and Northern Ireland	Canada	Germany	France	Italy
1928	93.3	94.4	92.5	98.6	91.0	91.6
1929	100.0	100.0	100.0	100.0	100.0	100.0
1930	80.7	92.3	84.8	85.9	100.4	91.9
1931	68.1	83.8	71.0	67.6	88.9	77.6
1932	53.8	83.5	58.1	53.3	68.8	66.9
1933	63.9	88.2	60.3	60.7	76.7	73.7
1934	66.4	98.8	73.5	79.8	71.0	80.9
1935	75.6	105.7	81.3	94.0	67.4	91.8
1936	88.1	116.1	89.8	106.3	70.6	—

* "Yearbook of Labour Statistics," International Labour Office, Geneva, Switzerland, 1937, p. 217.

in industrial production in six leading countries of the world in each case was reached in 1932.

The degree of similarity, however, depends upon several factors. Thus the closest relationship is found in those industries whose products are sold in well-organized international markets, such as agricultural commodities and steel products. Industries enjoying local or domestic markets, on the other hand, are less sensitive to international movements of this nature, though they are likely, sooner or later, to feel the cyclical effects in any case.

The degree of international synchronization also depends upon the severity of the cycle and the stage of industrialization attained by various countries. Nations whose industries are primarily

agricultural occasionally show fluctuations that are quite out of line with those experienced by the more highly industrialized groups. Finally, business cycles are likely to extend to a number of different nations if the fluctuations owe their origin, in whole or in large part, to international disturbances such as wars, higher tariff boundaries, shortage of gold supply, and so forth. Not only do each of the countries involved experience similar influences, but international trade is a carrier of good or bad business conditions as well as of commodities. Thus the international aspects of business, as well as the purely domestic phases, must be taken into account in any proposed solution for the business cycle problem.

Cycle Theories Related to the 1930 Depression.—Some light may be thrown on the theories just discussed, particularly with reference to those dealing with overproduction, underconsumption, and capital formation, if the findings of a 3-year inquiry into the depression of 1930 are noted briefly.¹ Although this study did not reach a definite answer to the problem of the business cycle, and in spite of the fact that its conclusions have been criticized severely, it represented an earnest attempt to analyze the problem currently and it has clarified some of the points at issue. In the first place, only about 80 percent of our productive capacity as a nation has been utilized on the average even in the years of greatest prosperity. Thus poverty and low living standards, depression and unemployment, cannot be attributed solely to the lack of ability to produce goods. As a nation we have not been living beyond our means and the depression was not the result of inadequate productive facilities.

We may ask, in the second place, why 20 percent of our productive capacity is unutilized. Can it be that consumers as a whole have all the goods they want, and that our industrial system is overbuilt? This question clearly must be answered with an emphatic negative. Indeed the possibilities for the further expansion of industrial output should be tremendous, for 70 percent of the population in our most prosperous year was composed of families whose incomes were less than \$2,500 per annum. Such families spend almost all of their incomes for necessities and

¹ Brookings Institution, Washington, D.C., "America's Capacity to Produce," 1934; "America's Capacity to Consume," 1934; "The Formation of Capital," 1935; and "Income and Economic Progress," 1935.

so provide a vast potential market for comforts and luxuries of all sorts. If these families were to be supplied with the goods which government agencies consider essential to a "reasonable standard of living," it would be necessary to provide an increase in physical production of 75 percent above the 1929 level. America's capacity to consume goods does not limit production and was not the cause of the depression of 1930.

The limiting factor which prevents consumers from taking a much larger quantity of goods off the market each year is the connecting link between production and consumption. This limiting factor is purchasing power. The inequality in the distribution of income, and the problem of the formation of new capital, are intimately related to the purchasing power available for consumption goods. Two-thirds of the 15 billion dollars of savings made in 1929 came from the 2.3 percent of the population whose incomes were over \$10,000 a year. Since most of these individuals could not spend the whole of their incomes for goods, they were forced to invest the remainder. This investment does not in effect return the savings to other consumers fast enough to prevent a chronic inadequacy of consumer purchasing power for finished goods. Hence, if we are to raise the living standards of three-quarters of our population, and if we are to mitigate business cycles, we must permit consumers to buy continuously a much greater quantity of goods than at present. Engineers can care for most of the problems of production; consumers' wants are adequate to absorb the goods which could be turned out; but a solution must be found for the problem of inadequate purchasing power.

In the light of this conclusion some of the proposals suggested as cures for depression must be discarded. The curtailment of output characteristic of certain parts of the New Deal seems ill-advised as a long-run solution, for this policy tends to freeze production and living standards at existing levels. Limitation of hours for labor may be undesirable at present for the same reason. "Share-the-wealth" programs do not offer a solution, for most of the national wealth represents values placed upon property which cannot be shared to advantage. Furthermore, an equal division of the income from this wealth would provide each person with only about \$670 a year, whereas the solution we are seeking is a means of enlarging this income materially. Thus the

total national income must be increased so that everyone can have a larger quantity of goods and services.

The total national income can be increased materially only if production is enlarged. Enlarged production, in a capitalistic system, must be profitable and so requires an increase in consumers' purchasing power. Two methods of enlarging purchasing power are available, namely, higher wages or lower prices. Either one might prove to be profitable to businessmen if the scale of production were increased sufficiently so that a smaller per-unit profit would yield a larger total net profit. The method of higher wages is undesirable for two reasons. It runs counter to the competitive forces in our economic system, for any one producer by cutting wages may obtain a differential advantage in the short run which would prevent all producers from raising wages together. Furthermore, the method is a poor one because it does not affect all persons equally. Farmers and "white-collar" workers would be unable to gain from it, and unorganized labor generally might gain less than unionized workers.

The method of enhancing purchasing power through lower prices affects all consumers alike, and it is theoretically consistent with a competitive economic system. This solution also has certain weaknesses, however. Not all producers would be affected alike by price reductions. The proportion of expenses which are fixed, and the tendency to increasing or decreasing cost, would produce divergent effects. Moreover, capitalism strives earnestly to avoid the effects of the very force, namely competition, which might permit it to sustain its own markets. Free competition cannot be characteristic of all industry today, and any practical attempt to secure larger purchasing power through lower prices may be abortive. Two general possibilities remain. One is to attempt to enforce desirable modifications through government regulation, and the other is to attempt to change the economic system from capitalism to some other form. These possibilities will be discussed in succeeding chapters.

Other Remedial Measures.—Most writers who advance a particular cause for the business cycle usually propose a remedy designed to remove or at least to modify that cause. Inasmuch as no one theory satisfactorily explains the causes of the business cycle, it is unlikely that any one measure will remedy it completely. This does not mean, however, that we should not apply

any remedial measures. Some measures may mitigate the severity of the cycle, and this effect is to be desired.

Remedies for the business cycle are all too apt to be confined to the depression phase. Control of the cycle, to the extent that control can be exercised, should begin when business is good. As was pointed out in the discussion of the prosperity phase, it is during the period of "good business" that the maladjustments which lead to depression creep in. If the severity of the depression is to be mitigated, these maladjustments must be kept as small as possible.

After a depression begins, there is the task of "easing" the burden upon those who are most severely affected. If real recovery is to come about, the necessary adjustment between costs and prices must be made during the depression. Prior to the last depression, the tendency was for the government to let the depression run its course to "purge" the economic system of the ills contracted during prosperity. This step is desirable if the economic system can withstand the strains engendered. With the increasing interdependence of people and industries, however, this "natural cure" is apt to be more than the system can stand. As a result, many measures have been inaugurated to make the burden of the depression less severe upon certain groups. Thus the government has provided relief funds for the needy, has created work, has extended credit to farmers who were about to lose their property through the foreclosure of mortgages, and has made loans to businesses, large and small, which were in need of funds.

However helpful the alleviative measures may be to those who receive their benefits, the long-run effects upon the people as a whole may be harmful. Efforts to "ease" the depression may merely prolong it or tend to transfer it to a later time with even worse results. Every humane person recognizes the necessity of feeding the hungry and of caring for the genuinely needy. These are obligations which governments cannot escape. But the wisdom of greatly increasing public expenditures, in ways which increase public debts, beyond that required for these necessary expenditures is open to question.

Problems

143. Could there be a business depression in a barter economy? A handicraft economy? Why?

144. "People talk a great deal about overproduction but in reality it is underconsumption that is bothering us. People must be persuaded to consume more goods." Do you agree? Why?

145. The Kold Company is producing electric refrigerators at a cost of \$150 and selling them for \$200. If its monthly output is 5,000 units, compute its annual sales receipts, costs, and profits. Is the amount paid out (as cost) sufficient to purchase all the refrigerators? If not, who will provide the needed purchasing power? Explain.

146. a. Is it advisable to pursue a federal "pump-priming" program which costs 5 billion dollars and adds 10 billion dollars a year to the national income for 3 years?

b. What factors should be considered in analyzing this problem?

c. To what extent can the effects (desirable or undesirable) of "pump priming" be measured?

147. "In a 'boom' period, costs creep up on selling prices, profits are reduced and eventually a downward movement begins." Account (in at least four ways) for the narrowing margin between costs and selling prices during the "boom" period.

148. Is there any relation between the size of the federal debt and the number and severity of depressions? (See Chap. XXV for the federal debt.)

References

BERLE, A. A., JR., and VICTORIA J. PEDERSON: "Liquid Claims and National Wealth," The Macmillan Company, 1934.

Brookings Institution: "America's Capacity to Consume," 1934.

———: "America's Capacity to Produce," 1934.

———: "Income and Economic Progress," 1935.

———: "The Formation of Capital," 1935.

EDIE, L. D.: "Money, Bank Credit and Prices," Harper & Brothers, 1928.

FOSTER, W. T., and W. CATCHINGS: "Profits," Pollak Foundation for Economic Research, 1925.

HANSEN, A. H.: "Economic Stabilization in an Unbalanced World," Harcourt, Brace & Company, 1932.

KEYNES, JOHN MAYNARD: "The General Theory of Employment, Interest and Money," Harcourt, Brace & Company, 1936.

MITCHELL, W. C.: "Business Cycles," National Bureau of Economic Research, 1927.

PIGOU, A. S.: "Industrial Fluctuations," 2d ed., The Macmillan Company, 1929.

SNYDER, CARL: "Business Cycles and Business Measurements," The Macmillan Company, 1927.

WAGEMANN, E.: "Economic Rhythm: A Theory of Business Cycles," McGraw-Hill Book Company, Inc., 1930.

CHAPTER XXII

LABOR RELATIONS

Labor relations are established whenever one person begins to work for another. Irrespective of the nature of the work it is necessary for the parties involved to reach, sooner or later, an understanding about such basic requirements of employment as the amount of wages to be paid, the number of hours to be worked, and the manner in which the work is to be performed. The arrangements may be quite simple, yet the possibilities for friction may be many. It can hardly be otherwise. The job may be fatiguing and uninviting. Many jobs in modern industry are monotonous, impersonal, and insecure. In the important matter of wages there is apt to be a conflict of interest, based upon the simple proposition that wages constitute a cost to the employer and an income to the worker. Then, too, there is always the *human* element in the problem. When one buys lumber or gasoline, for example, he is usually concerned only with its price and quality, but when one buys labor he cannot separate the labor from the person of the laborer.

Labor's Objectives.—To many persons the so-called labor problem is merely a matter of wages. Undoubtedly the age-old question of how the product of industry should be divided, the "distribution" problem, as the economist calls it, is and probably will remain the most controversial issue between employers and workers. With the passing of time, however, some of the emphasis has shifted from the relative size of the shares as such to the broader, underlying issues relating to their determination. The right to organize, to bargain collectively through representatives of their own choosing, to have a contract with the employer specifying wages, hours, conditions of employment, and methods for settling grievances and disputes, represent some of labor's evolving objectives. Except in those industries where wages are still very low, labor's struggle is not a "bread-and-butter" matter but a constant and inevitable drive for improved

status in the social system, a movement which is becoming increasingly political in its outlook.

Whether the rank and file of workers, even among those who belong to unions, can understand or are interested in the ultimate objectives of some of the labor leaders is questionable. Many workers want immediate and tangible results. If the leaders can persuade them that joining a union and then striking for its recognition, if necessary, are prerequisites to obtaining higher wages and better working conditions they will fight strenuously for those objectives. In time, the long-run argument for improved status will impress some workers and they will, if necessary, forego present gains for long-run advancement. But the fact that labor leaders sometimes attempt to obtain the checkoff, a device by which the employer deducts union dues from wages and transfers them to the union, suggests that not all workers who consent to join the union believe that membership therein is of sufficient value to pay dues voluntarily.

The Background of Industrial Conflict.—The fact that workers temporarily may be satisfied with the amount of wages they receive and the number of hours they work does not preclude industrial conflict, as was evidenced in the bitterly fought "little steel" strike in 1937; nor does a demand for union recognition when wages are not the primary consideration necessarily lead to open strife, as was evidenced by the "big steel" agreement with the SWOC (Steel Workers Organizing Committee) earlier in the same year. Industrial conflicts arise out of certain combinations of circumstances or conditions associated with the way industry is being conducted, the psychological basis of human behavior and, as we shall see a little later, with general economic conditions. Legislation and court decisions by defining, increasing, or decreasing the powers, rights, and obligations of either employers or employees also may lead to an increase in the number and seriousness of industrial disputes.

Capitalism and the Wage Earner.—The twentieth-century worker finds himself in the midst of a type of economic organization which has been called the *capitalistic system*. It is a system of production based largely upon power-driven machinery; one that demands a huge money investment, not merely to buy the expensive machinery and equipment, but to finance the making, storing, and selling of goods in the *roundabout* methods employed.

This type of economic organization depends upon the presence of a capitalist class with sufficient financial resources to build and to equip factories, warehouses, and stores; to hire other people to manage them; and still others to work in them.

The persons who supply the capital obtain control of industry, though their claim to such control logically may be no better than that of the workers. The amount of money needed to finance industry is so great as to preclude the possibility that wage earners, at least under the present level of income, will supply any considerable portion of the funds. Labor individually or as a group is thus barred from any appreciable degree of financial control through investment. The remote control exercised by the owners of industry takes the form of direction through the ownership of voting securities. The use of voting securities gives great power to investment bankers. Their presence is felt by their control over the plant production managers who alone maintain contact with the workers.

The payment of wages, the length of the working day, indeed all the terms of employment including the much vexed question of labor unions may, therefore, be largely dependent upon the ideas of men who are not engaged in production, who have no immediate picture of actual working life in the plants, and whose first question in regard to all labor policies is apt to be: What effect will they have on the securities and their value in the market? That this situation may exaggerate the evils arising from the impersonal nature of the corporation is obvious.¹

There is danger of overemphasizing the influence of capitalism upon the labor problem. Capitalism, with all that the term implies, did not make the labor problem; it merely added new and sometimes grave difficulties to an existing problem. Nor did large-scale industry make the labor problem; it also merely added new and complicating factors to the situation. Although the ordinary worker in a large factory cannot carry his complaints directly to the president of the corporation, he can obtain a hearing if there is a well-organized personnel department. By so doing he often can secure an adjustment of his difficulties. The basic problem in present-day labor relations is to find means of squaring personnel relations with the modern type of corporate organization.

¹ ESTEY, J. A., "The Labor Problem," McGraw-Hill Book Company, Inc., 1928, p. 6.

The virtues of small-scale industries, from the workers' viewpoint, sometimes have been unduly emphasized. Some factories are known for their unsatisfactory labor conditions. Direct contacts between employees and the "boss" not infrequently lead to antagonism and contempt. Some of the most bitter labor troubles have occurred in small clothing companies, in coal mines, and in the building trades. Many small employers, erroneously believing that they have no labor problem, woefully neglect matters of human relationships.

Psychological Factors in Labor Disputes.—Many labor disputes arise because of the inability of the persons concerned to see "eye to eye" on the questions at issue. The failure of the disputants to meet on common ground may be due to any one or a combination of many factors which can be analyzed, if at all, only in terms of human behavior. Workers and employers, and the public, too, think and act as they do because of their hereditary equipment and what they have been taught by their environment; which of these influences is the greater in any given case is a matter of dispute among psychologists.

1. *The Attitude of Employers.*—What determines the response an employer will make to a given industrial situation involving relationships with his employees? . . . On the side of heredity one should know his bodily condition, for the effect of body on mental outlook has been clearly demonstrated. One should also try to discover the degree of instinct expression which his mode of living has allowed. Which of these inborn tendencies seem uppermost? Along what lines have they been expressed, or have they been largely repressed?

Has his business permitted full play to his desire to be creative? Probably, if he builds bridges or skyscrapers; probably not, if he manufactures garters or pins. . . . Continuing the analysis, one would inquire as to the strength and adequacy of outlets for his other desires, such as his desire for children, his desire for social approval, the desire to mingle with his fellows, the sex instinct, the desire for change. . . .

What are his religious, political, social and racial beliefs and prejudices? . . . Did he go to an exclusive preparatory school and college as a member of an aristocratic family which has always had a high sense of *noblesse oblige*, or is he a new-rich, self-made, rather narrow and uneducated plutocrat who has risen from the ranks by sheer hard work or force of personality or shady dealings?¹

¹ DAUGHERTY, CARROLL R., "Labor Problems in American Industry," Houghton Mifflin Company, 1936, pp. 30 and 31.

2. *The Attitude of Workers.*—A detailed psychological analysis of workers' attitude and actions is also necessary. It should begin with full acceptance of the fact that wage-earners are human beings similar to employers in native wants and desires and needs. . . . It is among employees that inadequate expression of inborn drives may be most expected, and, on this account, that unrest and discontent are widespread. If workers' jobs and the ways of life they afford are repressive, it is only natural to expect mechanisms of escape and defense, such as soldiering on the job, open violence in strikes, . . . [and] belief in . . . employers' . . . lack of interest in employees, the exploitation of the masses, "anything is all right if you can get away with it," [and] the bias of judges and legislators.¹

Joint Relationships.—The various aspects of labor relations are reflected in the principles and methods used to adjust the conflicting and mutual interests of employees and employers. The mechanisms which have been developed for effecting these adjustments are:

1. The individual contract.
2. The union contract.
3. The employee representation plan.
4. Labor legislation.

I. THE INDIVIDUAL CONTRACT

The majority of American workers have always been employed on an individual contract basis. Traditionally the employer has taken the initiative in promulgating a contract by offering a certain type of work at a "price." If the prospective employee has more remunerative offers of employment, he can demand, and probably receive, higher wages; if, however, work is slack and the prospective employee is urgently in need of income, as is the usual case, he probably will be obliged to accept whatever offer, if any, he can receive. In other words, competitive conditions of the market play the most important part in establishing the individual contract.

During the early history of this country practically no means were available for protecting workers. Labor unions did not exist or were too weak to be effective. Protective legislation had made little or no progress. Liberal employers, in the modern sense, were few in number. Yet some workmen were able to escape from unsatisfactory labor conditions. On the one hand,

¹ *Ibid.*, pp. 31 and 32.

a man could establish an independent business with a small amount of capital. On the other hand, farm land could be had for the asking. When conditions in the towns became unsatisfactory, the worker at small cost could become a farmer, or at least he might move on to a frontier settlement. Greeley's dictum, "Go west, young man, go west," was followed in thousands of cases.

Year by year the situation changed. Gradually, the better land became more completely occupied and more expensive to purchase. Agricultural pursuits became overcrowded. The old outlets from unsatisfactory working conditions became less and less attractive. Three substitutes gradually developed: (1) labor unions, (2) employee representation plans, and (3) labor legislation.

II. THE UNION CONTRACT

Union Organization.—Trade unionism is an old institution. Journeymen bakers in Paris engaged in strikes in the sixteenth century. The London printers had a strong union by 1666. In 1836 there were fifty-three unions in Philadelphia and fifty-two in New York. The National Labor union was founded in Baltimore in 1866. Three years later the Knights of Labor was organized in Philadelphia, and the American Federation of Labor was formed in Columbus, Ohio, in 1886 from a skeleton organization set up in Pittsburgh in 1881.

The American Federation of Labor.—The American Federation of Labor is the oldest federation of unions in the country. In addition to 111 national and international unions, its membership includes 4 departments, 522 local departments or councils, 49 state federations, 734 city central bodies, 914 local trade and federal labor unions, involving in all over 32,900 local unions with a membership of some 3,600,000 workers.¹

The A. F. of L. is based upon the principle of *craft* autonomy. In a given city, for example, there may be one or more machinists', carpenters', or musicians' *locals*. These locals in turn belong to a *national* union, or in some cases to an *international* union. Once formed, the national unions organize new locals, raise strike funds, represent the locals in labor disputes, occa-

¹ American Federation of Labor, *Report of the Proceedings of the Fifty-sixth Annual Convention*, 1936, p. 24.

sionally provide sickness and retirement funds, promote labor legislation, and so on. The national unions within the federation have control over their respective trades. The federation, through its departments, attempts to settle jurisdictional disputes such as those between carpenters and metalworkers in the building trades, works for favorable legislation, averts or aids strikes, helps to build up membership, engages in educational programs, and supports or opposes various other measures. Since its organization, the A. F. of L. has been opposed to direct political methods, such as the organization of a labor party. The

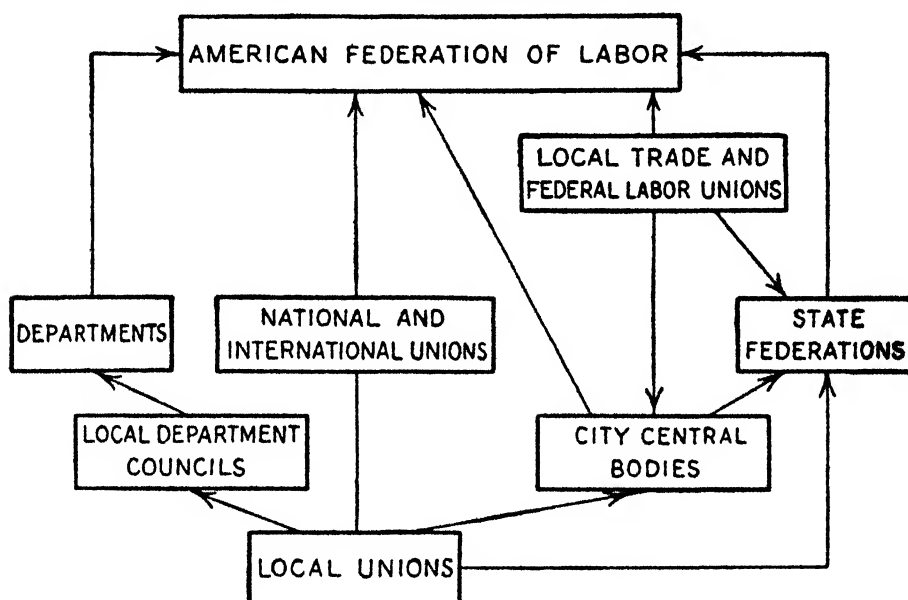


FIG. 48.—American Federation of Labor organization.

A. F. of L. maintains contacts with the International Labour Office, Federated American Engineering Societies, and similar organizations.

Other Types of Unions.—The *industrial* type of union is diametrically opposed to the craft form of organization. When all the workers in a given industry are members of a given union, irrespective of their particular trades or skills, the organization is called an industrial union. The *company* union is composed of all the employees of a given corporation or of a division thereof but has no members from other concerns. The *general* union is an organization that will accept all workers, no matter what their trades, companies, or industries. The Knights of Labor was intended to be such a union, but this type of organization is insignificant at present. The other forms, however, are the

centers of very bitter disputes. The problem of the company union will be discussed in a later section of this chapter, but the battle raging between the proponents of the craft and the industrial types of organization is to be noted here.

The Craft vs. the Industrial Union.—A struggle between the exponents of the craft union and the industrial union was inevitable. Those who sponsored the industrial union idea believed that the craft union, composed mainly of skilled workers in a restricted number of trades, showed too little concern for the unskilled and semi-skilled workers whose numbers were increasing with the development of the mass-production industries, and that craft unionism is only a structure commensurate with the handicraft system and not adapted to a type of production characterized by a shifting of skill from the worker to the machine. The industrial unionists further believed that the structural form of craft unionism overemphasized the "bread-and-butter" objective to the exclusion of certain ideals in which workers were becoming increasingly interested, and that even the craft unionist's search for more income was too narrowly restricted in that it was limited to the immediate interests of isolated groups of workers. To state the proposition positively, the industrial unionists believed that union organization must embrace all the workers who compete with each other directly or indirectly for jobs, and, more important, all workers whose solidarity on social and industrial issues is necessary if the economic status of any portion of the class of laborers is to be enhanced.

The National Industrial Recovery Act of 1933 (administered by the NRA) indirectly paved the way for an open break between these two concepts of unionism by declaring in Section 7a that:

Employees shall have the right to organize and bargain collectively through representatives of their own choosing, and shall be free from the interference, restraint, or coercion of employers of labor, or their agents, in the designation of such representatives or in self-organization or in other concerted activities for the purpose of collective bargaining or other mutual aid or protection.

The effect of the law was to hasten the movement to unionize a number of industries, particularly the mass-production industries. New "company" unions were hastily promoted and some existing ones were reorganized to harmonize with the spirit of

the NIRA. The A. F. of L., realizing its opportunity and spurred on by its critics, resorted to the federal labor union, a device which had been previously used in localities and industries where no craft unions existed, as an instrument for extending organization, without regard to craft limitations, to large numbers of factory workers in the mechanized industries. From June, 1933, to October, 1934, "the Federation organized and chartered 106 federal labor unions in the automobile industry, 75 in rubber manufacture, 20 in the aluminum industry, and about 30 in the cement industry. The total number of directly affiliated trade and federal labor unions increased from 673 in 1933 to 1,788 in 1934."¹

In 1935 the A. F. of L. issued charters to the International Union of United Automobile Workers and to the United Rubber Workers, but in doing so excluded certain craft workers already members of affiliated national unions. This procedure met with strong objection from the industrial union supporters who insisted that mass-production workers should all be members of the same union irrespective of jurisdictional claims. The dissenters, led by the United Mine Workers and the Amalgamated Clothing Workers, organized the Committee for Industrial Organization (CIO) and, after inducing the Amalgamated Association of Iron, Steel and Tin Workers (SWOC) to join them, began an active campaign to unionize the iron and steel industry. Meanwhile, NRA had been declared unconstitutional, but the federal government continued to encourage unionization and collective bargaining by the passage in 1935 of the National Labor Relations Act, which will be discussed below. Encouraged by government support and initial successes, the CIO waged an active campaign for unionization of the motorcar industry and finally succeeded, with the help of the "sit-down" strike, in gaining recognition from the General Motors Corporation, the Chrysler Corporation, and a few other automobile manufacturers. About the same time the organization work in the steel industry began to show results and the Carnegie-Illinois and other divisions of the United States Steel Corporation signed collective bargaining agreements with the SWOC. Thus, in a comparatively short time, the CIO had wrung recognition from several "giants" in the traditionally anti-union field.

¹ *Monthly Labor Review*, January, 1937, p. 3.

Yet in spite of its successes the CIO has had some reverses. In 1936 the A. F. of L. suspended ten international unions which held membership in the CIO. The incessant warfare between these two labor groups, part of it probably due to personality conflicts, has sapped the energies of both and has weakened the labor movement at the time of its golden opportunity. In 1937 the steel division of the CIO, the SWOC, failed in its strike to gain recognition from a group of independent steel companies. In this and other strikes considerable public hostility developed against the CIO and the leaders were urged by friendly public officials and others to purge the unions of "undesirable" members and to modify tactics in various respects. The CIO probably suffered from too rapid organization, the leaders apparently being unable in some instances to control some of the activities of local unions.

Associations of Employers.—Over 2,000 employers' associations have been formed in this country for various purposes, an important one of which is the handling of industrial relations problems. Some of these associations are local, such as the building contractors' organizations; statewide, such as the Illinois Manufacturers' Association; or national, such as the National Founders' Association. The National Association of Manufacturers, composed of some 3,000 members in all fields of manufacturing, is the leading general association of employers. It concerns itself with many matters of importance to manufacturing, including labor relations policies. Through its open-shop division, the N. A. M. has opposed various union policies, particularly the "closed shop."

Generally speaking, employers' associations may be divided into two general types in respect to the policies of joint relationships. The *conciliatory* type proceeds on the assumption that unions are useful, either to facilitate bargaining arrangements or to control competitors, and that they should be at least tolerated if not encouraged. By building up a strong counterorganization the conciliatory type of association hopes to command enough respect from the unions to insure industrial good will.

The *belligerent* type of association, as the name implies, is organized to prevent the encroachment of unionism in the plants of its members. This objective is sought by keeping employees satisfied on an individual bargaining or company union basis,

or by waging war with the unions if necessary. If a strike is called on a member, the association may request other members to fill orders and return the profit, supply strike breakers, advance reserve funds, and in other ways help to break the strike; conversely, the member who recognizes a union without permission will be expelled and his reserve fund with the association confiscated.

The General Theory of Unionism.—Unionism is based upon the proposition that a worker, bargaining as an individual, is unlikely to obtain a fair wage and satisfactory working conditions, particularly if the employer is a powerful corporation. This belief is premised upon two basic assumptions. First, the employer is a more skillful bargainer than the employee. Since he possesses more knowledge of the labor market and more wealth, he can dictate the terms of employment. Second, the employee is not only at a bargaining disadvantage compared with the employer but also faces persistent competition through the undercutting of other employees, some of whom may be out of work and thus may be willing to accept employment at very low wages.

Apply the above points to the modern corporation. A 10 million-dollar corporation means that (1) many dollars are combined under a plan of unified control and (2) the dollars are invested in capital equipment, which is one of the factors of production. Hence, it is argued, if one of the two principal factors of production is organized and operates as a unit, the other principal factor, labor, should also combine and bargain collectively. If the 10 million-dollar corporation employs 1,000 workers, the 1,000 workers together are as important to the corporation as the corporation is to the workers. The loss of 1, 10, or even 100 workers, however, would not be felt seriously by the corporation, though the loss to any one worker of a job with the corporation might be a serious matter indeed.

Unionists argue further that a minimum wage must be established below which laborers should refuse to work. To use the above case, if the 1,000 employees were getting \$5 per day, and if outside workers agreed to accept \$4, even though there were only relatively few of them, the \$5 wage could not be maintained and a general wage cut would result. As long as the workers bargained as individuals, the employer could cut their wages, one

at a time. This process is approximately what happens when a company lays off some or all of its employees, only subsequently to rehire them individually at lower wages.

The Closed-shop Controversy.—Unionists insist that their experience has taught them that, unless the employer cooperates, they cannot maintain the standard rates of pay and satisfactory working conditions as long as any considerable number of employees do not belong to the union. This situation has led the unionists to fight for the *closed shop* which, stripped of all misleading definitions, means a shop in which all the employees belong to a union. In some unions high initiation fees and other prohibitions make it difficult or even impossible for outsiders to obtain membership. Such organizations have been referred to as *closed unions*. The closed shop with the *open union* permits anyone who gains employment to join the union, but prohibits anyone from working who is not a member of the union.

The closed shop is thus a means to an end. Once a skeleton union is organized, new recruits can be more easily obtained. When a sufficient number of the workers have joined the union, the employer will be asked to engage in collective bargaining. If the employer or any of the non-union workers insist upon the right of individual bargaining, the closed shop immediately becomes an issue. If the union cannot obtain a contract including the closed-shop principle, it may decide to take what it can get today in the hope of winning the closed shop tomorrow. The employer, however, may refuse to sign any contract today precisely because he fears the closed shop tomorrow.

Collective Bargaining.—The primary function of labor organizations is to enable workmen to bargain collectively. Collective bargaining exists when the employer makes an agreement, usually in writing, with the representatives of organized workers. Such agreements are called union contracts and ordinarily cover wages, hours, conditions of work, and methods for adjusting grievances. The following is a summary of the principal provisions contained in the historic union contract signed by the SWOC and subsidiaries of the United States Steel Corporation on March 17, 1937.¹

Recognition.—In addition to recognition of the union as the collective bargaining agency for its members, the steel companies agree that there

¹ U. S. Bureau of Labor Statistics, *Labor Information Bulletin*, April, 1937, pp. 11 and 12.

will be no discrimination, interference, restraint, or coercion against any of their workers because of membership in the Amalgamated Association of Iron, Steel, and Tin Workers. The union, on the other hand, agrees not to intimidate or coerce employees into membership and not to solicit members during working hours or on plant property.

Wages.—All union workers paid on an hourly basis receive an increase of 10 cents per hour, effective March 16, 1937. Wage increases equivalent to 10 cents an hour are provided for employees working on a tonnage or piece-rate basis. Where alleged inequalities in wage rates prevail, the agreements provide that these matters may be taken up by local plants.

Hours of Work.—The agreements provide for an 8-hour day and a 40-hour week. Overtime work in excess of 8 hours per day or 40 hours per week is to be compensated for at the rate of one and one-half times the regular rate.

Adjustment of Grievances.—Both parties agree to make earnest efforts to settle all differences arising out of the interpretation or application of the provisions of the agreement. In no case is there to be a stoppage of work. Definite machinery is outlined for settling grievances, with the proviso that all unsettled disputes shall be decided by an impartial umpire whose decision is final.

Seniority.—Five factors are to be considered in cases of promotion or increase or decrease in the working force. Individual promotions or layoffs will be based on: (1) Length of continuous service; (2) knowledge, training, ability, skill, and efficiency; (3) physical fitness; (4) family status, number of dependents, etc.; (5) place of residence.

Discharged Employees.—Employees who feel that they have been unjustly discharged may appeal to their union grievance committee. If the grievance committee and representatives of management decide in favor of the worker, he is to be reinstated and paid full compensation at his regular rate for the time lost. Discharge cases must be taken up and disposed of within 5 days from the date of the employee's dismissal.

Vacations and Holidays.—Union workers with 5 years' continuous service with the company are to receive 1 week's vacation with pay. The amount of vacation pay is to be based on the employee's average rate of earnings during the two pay periods immediately preceding his vacation.

Safety and Health.—Each company will continue to make reasonable provisions for the safety and health of its employees. Guards for machinery, proper wearing apparel for workers, and other equipment to protect them from injury will be provided by the employer in accordance with the practice which now prevails in each plant.

Other Provisions.—Management is given exclusive authority in directing the working force, hiring, suspending, or discharging workers for proper cause, or relieving employees from duty because of lack of work or other legitimate reasons. This right of management cannot be used for the purpose of discriminating against any member of the union.

Future Conferences.—The present agreements continue in force until March 1, 1938. Joint conferences between representatives of the companies and the union are scheduled to begin in Pittsburgh February 8, 1938.

These meetings will negotiate the wages, hours, and working conditions to apply after the expiration of the present agreement.

Value of Union Contracts.—Union contracts, if lived up to by both parties, have some distinct advantages. The workers are protected against wage cuts or unsatisfactory working conditions. The employer can estimate his labor costs in advance more easily since they will not increase unexpectedly within the specified time. Advance knowledge of labor costs is particularly valuable in all types of contract work. If the contract includes a number of unions and competing employers, any one employer knows that he will not have to face the competition which arises when another employer reduces his costs by cutting wages.

When Stanley Baldwin retired as Britain's prime minister in 1937 he took occasion in his farewell address to business interests to comment on union contracts somewhat as follows:

This country [Great Britain] owes much to the steady development of the habit we have acquired of settling conditions of employment by joint negotiations and to the thoroughgoing way in which both sides, although strenuously fighting their own part, recognize their obligation to observe settlements when made.

Our agreements are voluntary agreements. They are not imposed by the state, and their strength lies in the appeal they make on their merits to all concerned to obey them.

A. LABOR'S CONFLICT WEAPONS

Organized labor uses several different weapons in attempts to attain its ends. Of these, the strategy of organizing, the strike, picketing, and the boycott are the most common.

The Strategy of Organizing.—There are no hard and fast rules about organizing workers into unions. Methods vary with local conditions, the nature of the industry, and the type of employer. That the organizer must proceed with caution and tact and apply psychology in his work may be seen in the following instructions issued to union organizers.¹

Find out specific complaints even if they seem trivial. . . . Find out and play up the obnoxious traits of particular bosses and foremen. . . . Make contacts with liberal groups, the industrial department of the Y. W. C. A., sympathetic ministers and priests. . . . Some organizers

¹ Reprinted in *Mill and Factory*, Vol. XX, No. 2, 1938, pp. 48 and 49.

find that it pays to attend church for a while. . . . Bend over backwards to avoid any damaging rumors.

Be sure to speak in the workers' language. Use the time honored stories: Aesop's fable about being able to break the single stick but not the bundle of sticks; Moses who gives Biblical authority to unions by being the first organizer of the Brickmakers' Union in Egypt against Pharaoh and who led the first "walk out" to the land of "milk and honey." . . . Quote Abraham Lincoln's famous declaration on the right to unionize and to strike. Destroy the fear of jail by recalling the prison terms of William Penn, John Brown and other famous Americans.

The Strike.—The United States Department of Labor defines a *strike* as "concerted withdrawal from work by a part or all of the employees of an establishment, or several establishments, to enforce a demand on the part of employees." Strikes are intended to cost the employer more money than would the granting of the demands of the union. It is part of labor's strategy to plan strikes carefully and to have them occur at a time when the employer is least willing to discontinue production. In the planning of strikes labor has learned to capitalize on discontent, both in getting workers to join the union and in stiffening their morale for the strike. A propitious time to prepare for a strike in an automobile factory, for example, is during the changing of models.

In the average automobile there are more than 10,500,000 decisions regarding the type of materials, types of tools and machinery, types and sizes of fits, shape and appearance of materials and other points in design and manufacture which have to be decided upon before the final production plan can be perfected. . . . These readjustments involve the habits, speed of work and compensation of the workers at every turn.¹

Grievances, real and imaginary, easily arise. In the hands of a skilled organizer they may be fanned into such a degree of discontent that workers will join the union and strike for what they regard as their just rights. When the strike is actually called, production will be held up on the new models just at the time when the demand for them is increasing rapidly.

Strikes may be *direct* or *sympathetic* in nature. A direct strike involves only the employees of an employer or employers against whom there is a direct grievance. A local coal miners' union

¹ BARCLAY, HARTLEY W., *Mill and Factory*, Vol. XX, No. 2, 1938, p. 38.

may strike against the operator of the mine in which they work, or all the miners' unions in a given "field" may strike simultaneously against their respective employers. While the coal strikes are in progress, transportation workers may declare a *sympathetic* strike and refuse to haul coal from these mines, even though they have no grievance against the railroad companies. If the sympathetic strike is extended to include all union workers in a given area, the general quitting of work is called a *general* strike.

Strike Statistics.—The trend in the number of strikes and the number of persons engaged in them may be seen in the accompanying table.

TABLE 59.—THE NUMBER OF STRIKES AND WORKERS INVOLVED, 1918–1936

Year	Number of strikes	Index 1923–1925 = 100	Workers involved	Index 1923–1925 = 100
1918	3,353	245	1,240,000	202
1919	3,630	265	4,160,000	679
1920	3,411	249	1,463,000	239
1921	2,385	174	1,099,000	179
1922	1,112	81	1,612,000	263
1923	1,553	113	757,000	123
1924	1,249	91	655,000	107
1925	1,301	95	428,000	70
1926	1,035	75	330,000	54
1927	707	52	330,000	54
1928	604	44	314,000	51
1929	921	67	289,000	47
1930	637	46	183,000	30
1931	810	59	342,000	56
1932	841	61	324,000	53
1933	1,695	124	1,168,000	191
1934	1,856	135	1,467,000	239
1935	2,014	147	1,117,000	182
1936	2,172	159	789,000	129

The United States Bureau of Labor Statistics table provides these significant facts about strikes in 1936:¹

Slightly more than one-third of the strikes lasted less than one week. Forty-two percent continued for more than one week, but less than one month. Five percent continued for three months or more.

¹ *Labor Information Bulletin*, May, 1937, pp. 10 and 11.

Union recognition, discrimination because of union membership, the closed shop, or other matters vital to union organization were the major issues in one-half of the industrial disputes. Thirty-five percent of the total number of strikes dealt primarily with differences over wages and hours of work.

Forty-one percent of the workers involved in strikes ending in 1936 obtained substantial gains as a result of the strike. Thirty-six percent secured partial gains or compromise settlements, and seventeen percent obtained little or no gain.

About 44 percent of the strikes were settled through direct negotiation between employers and union officials. Thirty percent were settled with the assistance of government conciliators or labor boards. About one out of every 5 strikes ended without formal settlement.

Picketing.—The employer's direct method of combating a strike is to keep his plant in operation. In his attempts to do so he has several alternatives. First, he may persuade some of his regular workers not to join the strikers. The foremen, old and new employees, perhaps part of the office force, may be used as a skeleton organization to fill orders from stock, to produce commodities most in demand, and to give the impression of "business as usual." Next, an effort may be made to induce some or all of the strikers to return to work. Finally, the employer may hire strikebreakers, sometimes at considerable expense, to take the places of the regular workers. Knowing that the strike cannot be won so long as any considerable number of persons are working, the union stations pickets at the entrances to the plant to discourage regular employees from entering and to dissuade strikebreakers from taking the jobs of the union members.

If the employer is able to keep workers on the job continuously, sometimes even using Pullman cars for sleeping quarters, the pickets have the added problem of preventing food and other necessities from entering the plant. If the strikers, by peaceful persuasion or otherwise, prevent trucks and railway cars from passing through the gates, the employer may use planes for making deliveries, or he may use or attempt to use the United States mails, a policy which raises many complications.

Picketing may take the form of peaceful persuasion by a few persons but sometimes such large numbers of strikers gather that the would-be workers are intimidated, even though no bodily harm may result. In the latter situation violence easily

occurs. The push of a striker, the fist of a strikebreaker, the club of a policeman, the jeers of onlookers—almost anything can start a general melee in an atmosphere highly charged with ill-feeling. Generally speaking, if one person stands at each entrance of a struck plant and peacefully urges workers to stay away, the picketing is held to be legal; but if workers mass at the entrance to a plant and attempt to intimidate would-be workers by threats of violence and coercion, the picketing is held to be illegal.

The Boycott.—If the strike and picketing fail to halt production the only recourse of the union is to attempt to prevent the sale of the employer's products. The issue then shifts from one of production to one of marketing. If the products are articles of general consumption, such as clothes, cigars, or restaurant meals, the members of the union or unions directly involved will first collectively agree not to patronize and may invite other unionists everywhere to "boycott" the employer or employers against whom the strike is being waged. If the employer is not producing final consumers' goods, woolen cloth instead of clothes, for example, the union may direct a *secondary* boycott against the clothing manufacturer or the retail outlet. Sometimes unions are strong enough politically to prevent government agencies from purchasing supplies from companies unfriendly to unions.

Note. See problems and references at end of Chap. XXIII.

CHAPTER XXIII

LABOR RELATIONS (Continued)

B. EMPLOYERS' CONFLICT WEAPONS

Labor disputes, like regular warfare, develop comparable modes of attack and defense. We have already seen how the employer attempts to keep his plant operating during a strike. In addition, the employer has positive methods of attack such as the lockout, the injunction, public strategy formulae, the black list, and the yellow-dog contract.

The Lockout.—The counterpart of the strike is the lockout. In the former case, the employees will not work; in the latter, the employer will not allow them to work. Either weapon means interference with production. A lockout is sometimes used to circumvent a strike, on the theory that the best defense is a good offense. If workers attempt to strike during slack business the employer can sometimes dispose of the dispute by showing that he has few or no orders and that there is nothing to strike about. Lockouts are far less numerous than strikes because most strikes occur when earning prospects are favorable, and at such times the employer is reluctant to shut down his plant.

The Injunction.—The injunction is a weapon in industrial disputes available to both employers and unions, but the latter have used it very little. Originally intended as an emergency measure, the injunction until recently has been the "Big Bertha" in labor disputes. It is a court order to do or to cease doing something. A judge issues the order; without the aid of a jury the judge determines if the order has been complied with; and, if it has not, imposes the penalty which he selects. Some injunctions are so sweeping in their scope as practically to stop a strike. For example, in the railway shopmen's strike of 1922, a federal judge, at the request of the Attorney General of the United States, issued an injunction enjoining the strikers from interfering in any way with the railroads and their employees in

. . . the performance of their public duties and obligations to transport passengers and mail; conspiring to interfere with the railroads in their lawful business or the employees in their work; loitering about the premises of the railroads; inducing or attempting to induce by the use of threats, violent or abusive language, opprobrious epithets, physical violence or threats thereof, intimidations, display of numbers of force, jeers, entreaties, arguments, persuasion, rewards or otherwise, any person to abandon the employment of said railway companies, or to refrain from entering such employment.

The American Federation of Labor even was prohibited from referring to the injunction in its annual report.

Union opposition to the use of the injunction in labor disputes was largely responsible for the passage by Congress in 1932 of the Norris-LaGuardia Act. The act lists nine specific actions which may not be enjoined by federal courts and states that the doing of any of these actions in combination shall not be judged a conspiracy. Further, the act provides that federal courts cannot hold union officers and members liable for the unlawful acts of union members or of an agent of the union "except upon clear proof of actual authorization, participation, or ratification of such act." Finally, the act broadens the definition of a labor dispute to make the above protective features apply even though the dispute is nation-wide, providing it is limited to one industry. In short, this "anti-injunction" Act was intended to give to labor about the same right that corporations customarily enjoy, namely, the right to restrain trade "reasonably."

Public Support.—Employers as well as unions seek public sympathy and support in the strike centers and in the nation at large. If a union can make a clear-cut case for higher wages or better working conditions, its chances of winning public sympathy are usually better than the employers'. If living standards are not immediately involved, as in a strike for recognition of the union, the employer, through various types of strategy, usually has more than an even chance of winning the battle of "public opinion." The technique of breaking strikes has been reduced to a formula¹ in which employers are advised to do the following things:

¹ This formula, which is sometimes called the Mohawk Valley Formula, was discussed in the *New York Times*, July 11, 1937, p. E-7.

1. Label union organizers as agitators, representing a small minority, intent upon arbitrary demands.

2. Advise the public, through businessmen's associations, schools, churches, and other media, that strikes are very costly to the community as well as to the direct participants.

3. Raise high the banner of law and order, emphasizing interference with the mails, blocked highways, assaults upon loyal workers and threats to their families, the dynamiting of property, and other unsocial acts.

4. Bring about the formation of a large armed police force by using the argument of "special emergency."

5. Promote a "back to work" movement, using a puppet organization if necessary, to convince strikers that their cause is lost.

Various other devices are used by some employers in their struggles with organized labor. *Black lists*, containing the names of workers who are opposed because of their union activity, are kept on file and circulated among other employers so that objectionable workers will not be hired. The national government and several of the states have outlawed the *yellow-dog* contract, an arrangement which requires an employee to sign a contract pledging himself not to join an outside labor organization. Organized labor has always objected strenuously to this procedure, not so much because it gave the employer a legal right to sue for breach of contract, but because it was illegal for third parties to urge employees to violate yellow-dog contracts.

III. EMPLOYEE REPRESENTATION

The third general method of establishing joint relationships is through various types of employee representation plans, the employer's approach to labor problems. Employee representation is a system of "government in industry" in which representatives of employees and management jointly regulate some of the conditions of employment. Just as the citizen enjoys the right of suffrage in political matters, so employee representation is expected to enable workers to enjoy certain rights in matters relating to their daily work.

Employee representation plans were first discussed in Germany in 1849, and works councils were formed as early as 1873. In England the Whitley Committee in 1917 recommended a far-reaching plan of employee representation that included not only works councils in individual factories but also national joint councils for entire industries. Throughout Europe industrial repre-

sentation plans are associated with labor organizations, in marked contrast to the situation in the United States.

To stimulate production during the World War, the United States government encouraged the formation of "industrial councils." Most of the wartime plans for joint relations were discontinued with the coming of peace, but the idea had caught hold and during the prosperous era of the twenties new plans were developed in many types of industries. The depression arrested the movement and many of the plans were discontinued. The company-union development growing out of the NIRA, to which reference has already been made, again stimulated employee representation plans, which in many cases were indistinguishable from the company union. With the subsequent decline in the importance of the company union, due to the application of the National Labor Relations Act, only those representation plans which were firmly entrenched or those associated with outside unions survived.

Types of Employee Representation Plans.—Several types of employee representation plans have been developed, of which one is the *industrial democracy* type. This plan is modeled after the organization of the federal government. Representatives of the workers compose a house, those of the foremen and department heads a senate, and those of the employer a cabinet. Motions may originate in either house, but for adoption they must pass both houses and be approved by the cabinet.

In the *shop committee* type both employees and the employer select representatives for a works council which decides questions as they arise. In case of disagreement within the council, the matter is referred to an officer of the company or to a neutral arbitrator for final decision.

Union-management cooperation is the only type of employee representation which involves the participation of an employee-initiated union with outside affiliations. Joint local meetings are held between union and shop-management representatives, and joint system meetings are held between the heads of the union and the representatives of the company. Wage problems usually are not discussed since they are cared for through the regular channels of collective bargaining.

Advantages of Employee Representation Plans.—Employee representation plans, if they are honestly conceived and equit-

ably administered, may bring beneficial results to employers, employees, and the public generally. Working conditions often are improved, since it is easier for management to understand labor's viewpoint. Plant morale may be bettered because grievances can be adjusted more readily. The settlement of disputes without stoppage of work becomes possible. Labor turnover can be reduced and production can be increased.

But, warns an engineers' handbook,¹

. . . representation probably is the worst possible expedient for the employer who does not want to play fair. Openness and publicity of the works council systems make it extremely difficult to deal with labor by methods which will not bear the light of day. Managers who want to "put something over" on workmen simply should not experiment with representation. *Absolute square deal is the essence of the representation idea.* The rights of the humblest worker, when once determined, should be respected; so should those of the officials.

Labor union leaders are in agreement that any type of employee representation plan based upon a so-called company union is not, and cannot be, to the interest of the workmen. This belief is premised upon the assumption that company unions are initiated by employers and that if employees are to be fairly and adequately represented they must be led by officers of their own choosing who represent unions which have been formed by union organizers.

IV. LABOR LEGISLATION

Labor legislation of various kinds is another general outlet from unsatisfactory working conditions. Some employers have demonstrated their capacity and willingness to provide satisfactory working conditions and a high degree of security for their employees. But, unfortunately, these individuals constitute a minority of all employers. The rank and file of employers probably do not take adequate care of the interests of their employees, partly because they do not wish to do so, partly because employees resent their doing so, partly because competition restrains them. Accordingly, the needed protection has been provided in part by laws designed to hasten the settlement

¹ ALFORD, L. P., "Cost and Production Handbook," Ronald Press Company, 1934, p. 1396.

of industrial disputes; by laws regulating the hours and wages of workers; by legal restrictions and requirements bearing upon the continuity of employment, safety, health, retirement, sanitation, and general welfare. So important has the last group become that the following chapter will discuss it in detail under the general heading "Social Security."

When workers organize unions and through them attempt to obtain higher wages, shorter hours and better working conditions, the result is sometimes an industrial dispute inimical to the public interest. Whether workers are justified in their demands or whether employers are justified in their refusals, the fact remains that innocent third parties suffer as well as the combatants. For this reason the orderly settlement of industrial disputes and, better still, the prevention of their occurrence are increasingly becoming recognized government functions. To this subject we shall now turn, prior to a brief consideration of wage and hour legislation.

The National Labor Relations Act.—In an effort to improve the condition of workers through the medium of collective bargaining, Congress in 1935 passed the National Labor Relations Act. The act, patterned partly after Section 7a of the NIRA, first provides that employees "shall have the right to self-organization, to form, to join, to assist labor organizations, to bargain collectively through representatives of their own choosing." To protect these rights the act creates the National Labor Relations Board (NLRB), which is given broad powers to prevent certain "unfair labor practices" affecting interstate commerce. Employers, for example, are prohibited from dominating or interfering with the organization of a union, from discriminating against union members in various ways, and from refusing to bargain collectively with the agency selected under the terms of the act.

In its work of determining whether there are, or have been, unfair labor practices, the NLRB must conform to certain standards and follow the procedures prescribed in the act. In general, the NLRB, upon receiving a complaint, has one of its representatives conduct a preliminary investigation, which is held without a hearing and without the calling of witnesses. If the NLRB determines that the findings of the investigator merit additional study of the case, a formal "hearing" is held by a trial examiner, at which witnesses are examined and the necessary

facts assembled to enable the NLRB to reach a decision in the case. In a majority of cases, the parties to the dispute reach an agreement before the NLRB is obliged to take formal action. If this agreement is not reached, the NLRB may then issue a formal order to the employer directing him to do certain things, such as to reinstate discharged employees or to refrain from interfering with the organization of a union. The NLRB is without power to enforce its orders and can only ask the Court of Appeals that they be enforced.

The National Labor Relations Act permits the NLRB to determine which labor group has a majority of workers in an employing unit and requires the employer to engage in collective bargaining with the group getting a majority of the votes cast in the election supervised by the board. (An individual employee or group of employees may present grievances to the employer at any time.) For some time after the act was passed there was much confusion as to just what was meant by the term "collective bargaining" as it applied to the act. Although the NLRB is without power to require a contract and can only insist upon a discussion of the issues in a dispute, the board has ruled¹ that if an agreement is reached it must be put into writing; that a refusal of an employer to enter a signed agreement constitutes an unfair labor practice and amounts to a refusal to bargain within the meaning of the act.

During the first 30 months of its existence nearly 13,000 labor relations cases came to the attention of the NLRB. Of this number, 36 percent were either withdrawn or dismissed; 52 percent were settled by the disputants after the board took the cases under consideration; and in only 12 percent of the cases did the board issue formal orders.

Although the act definitely requires collective bargaining (if a majority of the employees can agree upon an agency, *i.e.*, an A. F. of L. union, a CIO union, or any other type of union), it does not guarantee that a written contract will be signed nor does it preclude the likelihood of continued industrial warfare. This limitation raises the old issue of how to settle a labor dispute when the participants cannot of their own account reach a decision. What are the possibilities?

¹ NLRB, Case No. C-252; Inland Steel Co., Apr. 5, 1938.

Devices to Settle Industrial Disputes.—When a labor dispute reaches the stage of open conflict, the interests of all parties concerned, including those of the public, demand a quick settlement. The more important problem is to prevent disputes entirely or to keep them from flaring into the open. Generally speaking, the less the degree of compulsion exercised in effecting a settlement the better. Conciliation involves the least compulsion and compulsory arbitration the most.

Conciliation is a means of settlement in which representatives of labor meet the employer's representatives in an attempt to iron out the points at issue without the intervention of a disinterested third party. *Mediation* involves the intervention of a disinterested third party, who brings the disputants together in an attempt to reach a solution. The mediator acts merely as a go-between or agent of both parties, but does not reach a decision himself. Both national and state departments of labor mediate disputes. A mediation board may be called in by either disputant, or may offer its services, in the attempt to settle issues by mediation.

If the conciliators or mediators fail to effect a settlement they may suggest *voluntary arbitration*. Although both parties must agree to submit the case for arbitration, neither is legally compelled to accept the award. Some countries have set up systems of *compulsory arbitration*, in which both the submission of the case and the acceptance of the award are required by law. In New Zealand, for example, if a dispute cannot be conciliated or mediated it must go before a Court of Arbitration for settlement. Strikes and lockouts are prohibited by law, and arbitration awards are binding for at least 3 years.

Compulsory investigation also is used in the attempt to settle industrial disputes. The Canadian Industrial Disputes Act of 1907 provided that neither employees nor employers in public utilities and mines in interprovincial trade could change or demand a change in wages or hours of labor without 30 days' notice, and that all strikes and lockouts were unlawful until the reasons for the dispute had been investigated by a government board and then had been made public. The purpose of the 30 days' delay was to enable the parties involved to settle their differences by conciliation or mediation. If these failed, the

force of public opinion, once the facts were made known, was expected to result in a settlement.

The Railway Labor Act.—The Railway Labor Act of 1926, while by no means the final word in the settlement of labor disputes, nevertheless offers a realistic approach to the problem. Premised upon the assumption that the government should not be helpless when essential service is being jeopardized, the act provides that if the carriers and their employees cannot agree upon the terms of a contract, or cannot through boards of adjustment agree upon the settlement of disputes arising under a contract, either party can invoke the aid of the National Mediation Board. If the mediation board, as the impartial representative of the public, fails in its efforts to effect a settlement, it is required to propose voluntary arbitration. If both parties agree to arbitrate, the award is binding. If they refuse to arbitrate, the mediation board can refer the case to the President of the United States, who can, if he desires, set up a special emergency board which must make a report within 30 days concerning the manner in which the dispute should be settled.

The advantage of settling disputes in the general manner just outlined is that the issues of the conflict become clearly defined; the struggle is not permitted to drag on endlessly. Failure to reach an agreement at any point automatically sets up machinery to continue the negotiations. Moreover, the changing machinery permits either party to shift its position without loss of prestige. The value of the procedure is seen in the results. The great majority of disputes are settled in conference; the next largest number are disposed of by mediators; only a comparatively small number reach the arbitration boards, and a still smaller number are disposed of by presidential boards.

Wage and Hour Laws.—Both the state and federal governments have passed a number of laws to regulate hours and wages. All but a few of the states have maximum daily or weekly hours for women and about half the states have minimum wage laws for women. Hours of work for men in the field of transportation have been regulated by both state and federal laws in the interest of public safety, and the hours of men in especially hazardous industries, such as mining, have been limited in a number of states.

Attempts on the part of the federal government to regulate wages and hours have been partly successful in spite of the ill-fated NRA. The Public Works and Construction Projects Act (1933) provided for a 30-hour work week and "reasonable" wages for employees in government projects. The Walsh-Healey Public Contracts Act (1936) contained certain wage and hour requirements for employees working upon supplies to be furnished to the federal government under contracts exceeding \$10,000. Still other acts stipulated various wage and hour requirements. The most significant federal wage and hour legislation, however, came in June, 1938, with the passage by congress of the Fair Labor Standards Act of 1938.

The Fair Labor Standards Act of 1938.—This act establishes minimum wages and maximum hours for workers in "each industry engaged in commerce or in the production of goods for commerce." Exempted from this broad coverage, however, are various groups of persons such as farm laborers and employees engaged in the processing of agricultural products; executives, administrators, and members of professions; employees and outside salesmen in local retailing; employees engaged in retail and service establishments, the greater part of whose selling or servicing is in intrastate commerce; air transportation employees and persons engaged in fishing. The hour provisions of the act do not apply to employees with respect to whom the Interstate Commerce Commission is empowered to establish maximum hours under the Motor Carrier Act, 1935.

For the first year of its operation the act prescribes a minimum hourly wage of 25 cents. During the next 6 years the minimum wage may not be less than 30 cents per hour, and thereafter not less than 40 cents per hour, unless the Administrator in charge of the operation of the act (a presidential appointee who will direct a newly created Division of Wages and Hours in the United States Department of Labor) prescribes another rate, which in no case may be lower than 30 cents per hour.

The maximum number of weekly hours during the first year of the operation of the act is 44. This number is reduced to 42 in the following year, and thereafter maximum hours shall be 40 per week, unless "time and a half" is paid for overtime. No employer, however, shall be deemed to have violated these provisions if he is operating under a collective bargaining agreement

suitable to the National Labor Relations Board. Thus the ultimate goal of the act is a national minimum wage of \$16 per week earned within 40 hours of weekly employment.

The precise minimum wages for any industry at any given time are to be determined by an Industry Committee, which is appointed and convened by the Administrator and which is composed of representatives of the public, employees and employers. The Industry Committee is required to recommend to the Administrator the highest minimum wage rates (not exceeding 40 cents per hour) "which it determines, having due regard to economic and competitive conditions, will not substantially curtail employment in the industry." Thus the act requires wage classifications within industries when there are found to be variations in such factors as competitive conditions, production costs, costs of living, and customary wages.

The recommendations of the industry committees are filed with the Administrator who, upon giving due notice to interested persons, gives orders to carry the recommendations into effect. If the Administrator disapproves of the recommendations he may ask the Industry Committee submitting the report to reconsider its recommendations or he may appoint a new committee. "Any person aggrieved by an order of the administrator may obtain a review of such order in the United States circuit court of appeals."

The erection of a floor under starvation wages and a ceiling over inhuman hours, the creation of more jobs at higher wages, and the promotion of prosperity are clearly desirable objectives and few would deny the right of the government to attempt their attainment. But the question whether the regulation of wages and hours will bring about these desirable objectives is quite another matter. Let us consider for a moment the implication that mandatory higher wages and shorter hours will increase the national income. If it be true that a legislated 40-hour week at 40 cents per hour automatically provides more jobs at higher wages with a resulting increase in general prosperity, then shortening the hours still more and raising hourly wages accordingly should bring more prosperity, an untenable conclusion if the illustration is pushed far enough. Instead of saying that shorter hours and higher wages increase the national income it probably is more reasonable to argue that a higher national income makes possible higher wages and shorter hours, although a moderate

limitation of hours may increase the productive efficiency of workmen to some extent.

The public regulation of wages and hours, even though it be confined to determining minimum wages and maximum hours under flexible administrative provisions, encounters difficulties not unlike those experienced in the regulation of public utility rates and in the fixing of commodity prices. It is difficult, if not impossible in the long run, to control a few prices without controlling many other prices. While such complete control is both possible and necessary in a planned economic system operated by a central authority, it hardly fits into the framework of the present economic system in the United States, even though the present system is undergoing constant change.

Problems

149. It is estimated that about 75 percent of all engineers sooner or later come into direct contact with labor relation problems, either because they have persons working for them or because the company for which they work is involved in a labor dispute. If you are in this group some day, how will your attitude and sympathies be determined? How are they being determined today as a student?

150. Which is more important to you as an engineer—the size of your pay check or the right to have a voice in the management of your work? Why? Does either of these depend upon the other? Why?

151. What points should be covered by an agreement to secure industrial peace in subsequent working relations between the management and the union in a chemical products factory?

152. “If workers would not organize and strike for higher wages, shorter hours, and better working conditions, there would be no industrial relations problem.” “If employers would forget the profit motive, there would be no industrial relations problem.”

a. Are these quotations equally true? Why?

b. Would you favor either as a means of securing industrial peace? Why?

153. Distinguish between a strike and a lockout. A strike is sometimes considered illegal because it is held to be a conspiracy. May a lockout be illegal for this reason? Why?

154. What general factors will explain the changing number of strikes from year to year?

155. In the rubber industry the index of tire output per man-hour rose from 100 in 1914 to 250 in 1922 and to 506 in 1929, despite the fact that the tires increased in weight. If a tire worker received 40 cents per hour in 1914, how much should he have received in 1922? In 1929? What light does your answer throw upon the problem of determining what is a “fair” wage in labor disputes?

156. If the increase in productivity per man-hour mentioned above had not taken place, how much employment would the rubber industry provide today compared to what it did in 1914?

157. In view of the figures presented in the two preceding questions, how can one explain the increase in man-hours of employment in the rubber industry from 26 million in 1922 to 35 million in 1929?

158. Here are three statements dealing with the general problem of labor relations. On which points are they in agreement? Disagreement? If a group of workers and employers adopted these views as a "code of ethics" for labor relations, what general plan of employer-employee cooperation do you think would be in effect?

a. "The old methods have passed; the engineer has arrived. Are we in close touch with the men who make intensive studies of business problems? Have we established research bureaus? Have we given thought to the economies of business? Do we concern ourselves with the cost of production of materials? Modern business throughout its wide ramifications is a scientific problem and must be solved by the use of research and by analysis. The rule of trial and error will not bring results in modern business practice, and organized labor must adopt new methods and adapt itself to ever-changing conditions. Sometimes demands are made upon management without critical analysis of the facts as to whether or not industry can pay more wages and work fewer hours. The difficulties that ensue are often the cause of strikes and misunderstandings which are a clear waste—a waste that could be prevented if the human element were more clearly understood and were more carefully analyzed."—A labor union officer.

b. "Organized business has three principal kinds of objectives: Its service objectives, its collateral service objectives, and its personal objectives. It is the function of the business organization to supply the public with certain economic values that it needs or desires. In most industries, its competitive success depends on its ability to give the consumer greater values at the same or a lower cost, together with satisfactory service. Unless our goods or services find favor with the public, the income of the organization may be inadequate to satisfy the personal objectives of its members. In consequence, the first objectives of the business organization are its service objectives. The personal objectives of individuals and groups composing the organization necessarily are secondary to them. When any important individual or group elevates its personal objectives above the service objectives of the organization or industry, the fortunes of the latter eventually will wane, defeating a satisfactory achievement of the personal objectives of other individuals and groups within the organization, and probably its own."—An industrial management engineer.

c. "Practices condemned as unfair and unlawful for the employer must also be considered unfair and unlawful when used by the union. If interstate transportation of strikebreakers is wrong, for example, then interstate movement of strike pickets is equally wrong. If it is wrong to use martial law to open a closed plant, then it is equally wrong to use it to close an open plant. If coercion of workers by the employer is unfair, then coercion of

workers by pickets is equally unfair. Violence by one side is just as bad as violence by the other."—A newspaper editorial.

References

CUMMINS, EARL: "The Labor Problem in the United States," D. Van Nostrand Company, Inc., 1935.

DAUGHERTY, CARROLL R.: "Labor Problems in American Industry," Houghton Mifflin Company, 1936.

ESTEY, J. A.: "The Labor Problem," McGraw-Hill Book Company, Inc., 1928.

HABER, WILLIAM: "Industrial Relations in the Building Industry," Harvard University Press, 1930.

Labor Law Service (a continuous loose-leaf service), Commerce Clearing House, Chicago.

MACDONALD, LOIS: "Labor Problems and the American Scene," Harper & Brothers, 1938.

PERLMAN, S.: "A Theory of the Labor Movement," The Macmillan Company, 1928.

SEYMOUR, J. B.: "The Whitley Councils Scheme," P. S. King & Son, Ltd., London, 1932.

TEAD, O., and H. C. METCALF: "Labor Relations under the Recovery Act," McGraw-Hill Book Company, Inc., 1933.

WITTE, EDWIN E.: "The Government in Labor Disputes," McGraw-Hill Book Company, Inc., 1932.

CHAPTER XXIV

ECONOMIC INSECURITY

The worth of any economic system ultimately must be gauged by the quality and quantity of goods and services produced; by their distribution among the various members of society; and by the degree to which people generally are protected from the various hazards which confront them in their daily activities. Hazards of many types are ever present; all of them make life uncertain, and uncertainty is probably the most certain thing in life. Hazards may be of a personal nature such as premature death or injury; or they may involve tangible property such as damage by fire, windstorm, flood, or explosion; or they may take the form of financial loss due to the failure of contractors to fill contracts, or to liability for damages to the person or property of others. Hazards may be of a broad social nature such as wars and political disturbances, or they may be intimately connected with one's capacity to earn a livelihood. This latter group of hazards, those which involve the security of the wage earner as such, may be referred to as economic hazards and will constitute the subject matter of this chapter.¹

Insecurity of the Wage Earner's Position.—More than 85 percent of the income-receiving population in the United States must work for a living. Anything, therefore, which diminishes their capacity to work is likely to curtail or to stop their incomes. Work capacity may be impaired by either of two general hazards—unemployment due to many causes, or physical impairment due to injury, sickness, or old age. Each reacts upon the others; unemployment impairs physical capacity to work; injuries impair health; illness hastens forced retirement; and so on around the vicious circle.

Unemployment is an ever-present possibility for workers of all classes. Even in such a relatively prosperous period as that from

¹ Life and accident insurance and various types of property insurance, the writing of which is usually done by private companies, were discussed in Chap. XX.

1923 to 1926, the minimum volume of unemployment in this country fluctuated between 1,669,000 and 2,315,000. By 1930 the average volume of unemployment was 4,921,000; in 1931 it was 8,634,000; in 1933 it reached the stupendous total of 13,176,000, or over 26 percent of the employable population.¹

Each year nearly 100,000 persons are killed in accidents in the United States. Of this number nearly a fifth lose their lives in the course of their regular employment. Two and a half million other persons are injured. The annual wage loss attributable to industrial injuries amounts to more than a billion dollars; the annual total loss probably to 4 billion dollars. In the latter item are included the cost of medical and surgical attention, and the overhead cost in connection with the payment of claims, as well as a heavy indirect cost in lost possible production.

Wage earners lose on the average about 7 days' employment a year because of illness, including illness resulting from occupational diseases. The total annual expenditure for medical care in the United States is estimated at \$3,656,000,000.² In addition, the loss of earnings sustained by sick persons and by those who die prematurely is estimated at as high as \$6,500,000,000.³

In 1860 only 2.7 percent of the American people were aged sixty-five or over; by 1900 the proportion had risen to 4.1 percent; today it is over 6 percent; and 50 years hence it is estimated that it will be over 12 percent.⁴ Even in normal times about one-third of these aged persons are dependent upon others for support. In depressions, when savings are lost and old persons lose their jobs, the proportion dependent upon others is much larger. In the absence of pension or insurance plans, many old persons are dependent upon charity and are kept in homes for the aged or live, sometimes unwelcomed, with children and relatives.

Self-help, Charity, and Government Relief.—Thrift and foresight have always been important factors in preparing for the

¹ These figures are estimates made by the Committee on Economic Security and reprinted by the Social Security Board in "Social Security in America," p. 56.

² Committee on the Cost of Medical Care, "Medical Care for the American People," 1932, p. 14.

³ RANKIN, W. S., M.D., The Economics of Medical Service, *American Journal of Public Health*, Vol. 11, No. 4, April, 1929, p. 360.

⁴ Committee on Economic Security, *op. cit.*, p. 141.

"rainy day." They have their shortcomings, however. An emergency may arise before sufficient time has elapsed for saving; the sums saved are often inadequate; savings may be lost through the failure of financial institutions, theft, or unwise investment. Moreover, the pressing needs of today frequently seem more important than the uncertain ones of tomorrow. Again many persons cannot save because of low incomes.

Relief through charity has been practiced in all countries for many years, running all the way from indiscriminate giving of alms to scientific treatment of dependency. With the exception of certain endowed institutions and organizations, charity is an uncertain method of relief; when funds are needed most they may not be available. Unless aid is to be given indiscriminately, it must be based upon some sort of a "needs" test which must necessarily be a ruthless invasion of one's most personal and private affairs.

Government relief plans have their drawbacks, too. To give aid without work in return will seem to many persons an unwise economic policy; to provide hastily jobs which will give employment to as many persons as possible may result in mere "boondoggling." Either plan is fraught with political dangers; neither plan can be followed without resort to a "needs" test, the effect of which is to level down the economic status of all persons, the thrifty and the improvident alike, to a common plane of destitution.

Social Insurance.—The shortcomings of these methods of alleviating economic insecurity can be eliminated to some extent through the use of the insurance principle, a device which has become the standard remedy the world over for coping with almost every conceivable type of contingency. Insurance is preferable to individual saving in that each person exposed to a hazard needs to set aside, through premium payments, only his share of the expected loss to which the group as a whole is exposed. Insurance is preferable to charity because of its greater certainty and because losses are paid on a contract basis as a "matter of right" without resort to a "needs" test. Insurance is preferable to hastily devised government relief plans because reserves are accumulated in advance and the rights of the recipients of benefits are clearly defined.

When a plan of insurance is prescribed and developed by legislative action, it is called *social insurance*. The state may pass a law to the effect that certain persons shall be insured against a given contingency, leaving optional the question as to whether the insurance shall be provided by private companies, special insurance associations, the state, or by the persons or company to be insured. The law, on the other hand, may state that the insurance shall be carried exclusively in a government fund. Under social insurance plans, the cost may be divided among the persons insured, the companies employing them, and the government. Sometimes employers or those insured pay the entire cost.

European countries pioneered in the development of social insurance plans. As early as 1883 Germany inaugurated a sickness insurance plan for wage earners, followed by workmen's compensation insurance in 1884 and old-age insurance in 1889. England began unemployment insurance in 1911. Today social insurance schemes afford millions of persons throughout the world a limited degree of protection against the principal economic insecurities.

Prevention or Relief?—The degree to which economic security—one of the greatest of luxuries—can be provided depends upon the capacity of individuals, groups, and organized society to prevent the occurrence of some economic misfortunes and to alleviate, as far as possible, those which cannot be prevented. Since prevention makes a cure unnecessary, any plan for dealing with economic hazards should, if possible, be preventive rather than remedial; but the fact that preventive efforts have been tried should not blind us to the need for alleviation if prevention fails. In point of time, efforts to provide relief frequently have preceded attempts to prevent the occurrence of the contingency for which relief is given. When the cost of relief becomes too great or dissatisfaction with it becomes too strong, both the giver and the receiver are likely to shift emphasis to preventive measures.

I. PROBLEMS OF UNEMPLOYMENT

A person is unemployed when he is able to work and willing to work but is unable to find a remunerative occupation. Such involuntary idleness of employable persons, whether only temporary, part-time, or full-time, identifies unemployment with

causes residing in industry and in the economic system. These causes are many and complex, ranging from the winter unemployment of a single gardener to the mass unemployment of millions of persons in a world-wide economic depression.

The Causes of Unemployment.—Although labor differs considerably from other commodities, because of the human aspect of the service, there is no gainsaying the fact that employers “buy” labor on a “labor market.” The price paid for labor is one of the costs of production and, like all other costs, its price is determined by the general forces of supply and demand. The causes of unemployment therefore may be classified in terms of the supply of labor and the demand for it. Broadly considered, the causes are:

1. Those relating to the *supply* of labor in the mass and in the various grades.
2. Those relating to the *demand* for labor as affected by changes in production methods and by fluctuations in business activity.
3. Those relating to an improper *organization* of the labor market.

The Supply of Labor.—The number of persons available for work depends (1) upon such general considerations as the size of the population, the rate of population growth, immigration and emigration, the proportion of the total population able and willing to work, and various governmental policies relating to the economic life of the country; (2) upon the quality of workers, their physical fitness, work habits, and industrial training, their willingness to be satisfied with substandard jobs, their ideas about living standards, and whether they bargain as individuals or collectively through unions; and (3) upon the policies of many employers of relying upon a reserve supply of labor.

The Reserve of Labor.—One of the paradoxes of economics is the presence, even in good times, of a reserve supply of labor. A noted English authority on unemployment,¹ after a long study of casual labor in England, reached these general conclusions: Whatever the demand for labor, the *supply* tends always and everywhere, not to coincide with it, but to exceed it. If work requires, for example, 98 men at most, the general formula for the supply of labor will be:

¹ BEVERIDGE, SIR WILLIAM, “Unemployment, A Problem of Industry,” Longmans, Green & Company, 1930.

80 men in regular employment.
20 men in irregular employment.
2 men unemployed at all times.

If 100 men are required to unload boats, for example, and are picked anew each day (like numbers from a hat), and if 3 days' work per week at \$2 a day represents subsistence, there will tend to be attached to the docks twice as many workmen as are needed.

If no one would accept irregular work, there would be no work of this sort; if there were not too many workers, there would be no material from which to form the reserve. New people and new circumstances make new demands for goods and services but the unequal race continues; there is chronic *underemployment*. Ultimately the supply of labor in any one field adjusts itself to the demand at a point allowing of reserves of men for local fluctuations. There is no one labor market but an indefinite number of partially separate labor markets. The more mobile the labor supply is, and the more freely it can pass from one market to another, the smaller will be the labor reserve.

The Demand for Labor.—Changes in the demand for labor are associated with three kinds of unemployment—*seasonal*, *cyclical*, and *secular*. Seasonal unemployment refers to recurring periods of idleness in industries which cannot be or have not been placed on a year-round basis. Cyclical unemployment arises from the fluctuations in business activity associated with different phases of the business cycle. Secular unemployment may be due to several causes, such as mergers and consolidations, the rise of new industries and the decline of old ones, the migration of industry, and to the introduction of so-called "labor-saving" machinery, new processes, and other technological changes. Unemployment attributable to the last mentioned causes has come to be referred to as "technological unemployment."

Seasonal Unemployment.—Practically all industries have some form of seasonal variation; the difference is one of degree. During the period 1923–1931, the range in monthly fluctuations in pay rolls from a yearly average index of 100 was 55 in women's clothing, 35 in automobiles, 25 in cement, 19 in steam fitting, 19 in furniture, and 17 in cigars and cigarettes. The 1930 census of the construction industry showed that the number employed in January, 1929, was only 56.2 percent of the maximum number

employed in August of that year. Fruit and vegetable canning, resort hotels, mining, railroading, and retailing have pronounced seasonal tendencies.

Technological Unemployment.—The statistical importance of unemployment due to the introduction of machines and new technology has been the subject of a world-wide dispute for many years. Both statistics and theories have been used unsparingly to prove and to disprove the contention that a substantial part

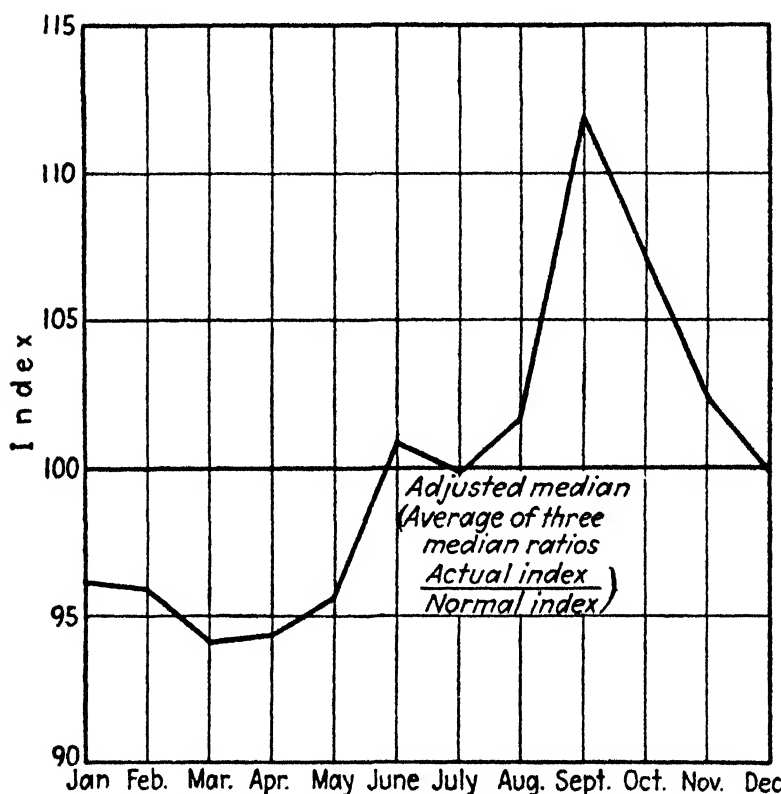


FIG. 49.—Seasonal index of food products employment in Ohio, 1926–1934.¹

of unemployment is technological, but certain basic facts bearing upon the question are so well established that they must be accepted by everyone. The total population of this country has increased over the years, more and more people have found jobs in an ever-expanding number of occupations, total output of goods and services has multiplied, production per wage earner has increased, the prices of most manufactured goods have decreased, and real wages have increased. These trends are clearly shown in American automobile production. In 1914 it required 71,376

¹ Compiled from Employment Indexes published by the Bureau of Business Research, Ohio State University.

persons to manufacture 543,679 passenger cars, which sold at an average price of \$761.20; in 1936 it required 368,000 persons to manufacture 3,807,371 passenger cars—an increase of 36 percent in cars produced per man—for a 31 percent larger population, which sold at an average price of \$536, or a 30 percent reduction. The average factory worker in 1914 had to exchange the labor of 3,000 hours for an automobile, but the worker in 1936 got an automobile for only 859 hours of labor.¹

The relative power of handwork and machine work to provide employment may be noted in these alternative methods of producing an inner shell of the hubcap of a Ford car:

The shell, made by machinery, costs 12-and-a-fraction cents. But the dies to shape it cost \$13,328, and the automatic press to stamp it costs \$30,770—a machine costing \$44,098 to make a 12-cent article. That is merely the cost of the press, it does not include the cost of factory space to house it, of generating the power to operate it, or expert service and replacements to maintain it. . . .

Machinery begins to create employment before it ever goes into production. Take this press. Divide its price by a day's wage of, say, \$7—for every dollar of material cost is ultimately reducible to someone's work. At this rate the press and dies represent 6,300 days' work, which at 5 days a week, 52 weeks a year, amounts to 24 years, 2 months, and 2 weeks of work. You may divide that amongst as many men as you please but a total of 24 years of employment at \$7 a day has gone into that press and its equipment before it does a stroke of work. Whatever its after-effect, you can see that the first effect of the machine is to create employment.

Now we put this press into production; it turns out 2,160 hubcap shells while a handworker is pounding out one. Would there be more jobs if only handworkers were employed?—for, really, it seems that this press at this production must be destroying 2,160 possible jobs.

Very well, let us consider making this article by hand. At first glance it seems to offer an advantage. Equipping a man with hand tools at \$24 would seem to be a great saving over a \$44,000 press. But, to produce as many hubcaps by hand, and to equip 2,160 men to do it, would cost \$7,742 more than the press. At once the cost of producing that shell would be increased by 17½ percent *for tools alone*. Then, there would have to be a factory to house those 2,160 men, which at Ford

¹ Figures estimated from material in Automobile Manufacturers' Association, "Automobile Facts and Figures," 1936; Biennial Census of Manufacturers, 1921; Department of Commerce and Bureau of the Census, mimeographed reports.

standards would cost at least half a million dollars and about \$38,000 a year to maintain, not including the cost of its two acres of land. A press requires 360 square feet of space; the handworkers with their benches would need 116,640 feet of space. . . .

In an 8-hour day, then, a man could pound out 2.7 hubcap shells. For the material used, and the day's wage of \$7.20 now paid on that work, those shells would cost about \$2.50 each. . . . If this principle were followed throughout all the manufacture of an automobile, you would not be buying a car at all. It is calculated that the cost of making a 1938 Ford car on this basis would be \$17,850. And at such a price, not 50 cars a year would be sold. There would not be work for *one* of those 2,160 men, nor for the 125,000 other men in the Ford industry alone. Without machinery there would be no automobile industry.

"Well," you say, "that would be bad. Could not you avoid that by paying for handwork just what it is worth?" Hardly, for under that arrangement a man on this hubcap shell job would earn about 18 cents a day. . . . From its very inception down to the last turn of its wheels, *industrial machinery creates employment.*"¹

These results are precisely what many economists would have expected. Improved methods of manufacture reduced production costs, which made possible lower selling prices, which in turn increased sales and lowered costs. Had the product been one with a relatively inelastic demand, salt or matches, for example, reduced prices would not have stimulated additional purchases greatly, but the reduction in the price of such articles would have enabled consumers to purchase more of other commodities, thereby increasing employment in other directions. Even if a commodity with an inelastic demand had been produced under monopoly conditions and its price had not been lowered, the reduction in costs would have increased the monopolist's profit, which probably would have increased the demand for labor elsewhere.

But other economists feel that this "long-run" analysis disposes of the question too readily. They point out that, if employment opportunities measured in man-hours are not to shrink, the volume of production must rise as rapidly as the output per man-hour. This they do not always find to be the case. For example, the average output per man-hour in American manufacturing in 1933-1934 was 25 percent higher than in 1929, but the total

¹ From a talk by W. J. Cameron on the Ford Sunday Evening Hour, Feb. 3, 1938.

volume of production was about the same.¹ Under these conditions the number of man-hours of employment furnished by the manufacturing industries was necessarily and at least temporarily reduced.

Irrespective of the long-run effects of technological changes, there is no gainsaying the fact that they do cause temporary unemployment. For short periods, at least, industry finds it profitable to substitute machines for human labor. Even if a worker who is displaced today is fortunate enough to find another job next week or next year, other workers in an unending stream will follow him into unemployment; new additions to the army of unemployment continually are being recruited. There is no absolute assurance that new industries and new jobs will develop rapidly enough to absorb all displaced workers, even in the "long run."

Cyclical Unemployment.—Cyclical unemployment results from the continuous swings of business through wide arcs of boom and depression. This cause of unemployment is the most serious of all. It involves more persons than do the other causes of unemployment and it also intensifies these other types. It comes unexpectedly and its duration cannot be forecast. During a depression the employed have fewer means of aiding the unemployed. Most serious of all, a solution for the business cycle is not in sight.

Cyclical unemployment strikes unevenly. For example, the percentages of persons unemployed in the following industries in July, 1934, were:²

Construction.....	64.9
Service.....	38.1
Mining.....	37.4
Manufacturing.....	27.4
Trade.....	19.5
Public service.....	5.1
Agriculture.....	1.1

In March, 1933, when unemployment was at its height, nearly 8 million producers of goods and nearly 6 million producers of services were idle. The classification of employment data in these two groups is an aid in thinking about our depression

¹ KAHLER, ALFRED, *Social Research*, Vol. II, No. 4, Nov., 1935, p. 453.

² Committee on Economic Security, *op. cit.*, p. 57.

problem, for it is the unemployment among the producers that causes the idleness among the providers of services.¹ Figure 50 shows the degree to which unemployment increased in the durable-goods industries—construction, steel, lumber, cement, machinery, and so on—in relation to the non-durable industries.

Unemployment among Engineers.—The heavy unemployment in the durable-goods industries and the resulting decline

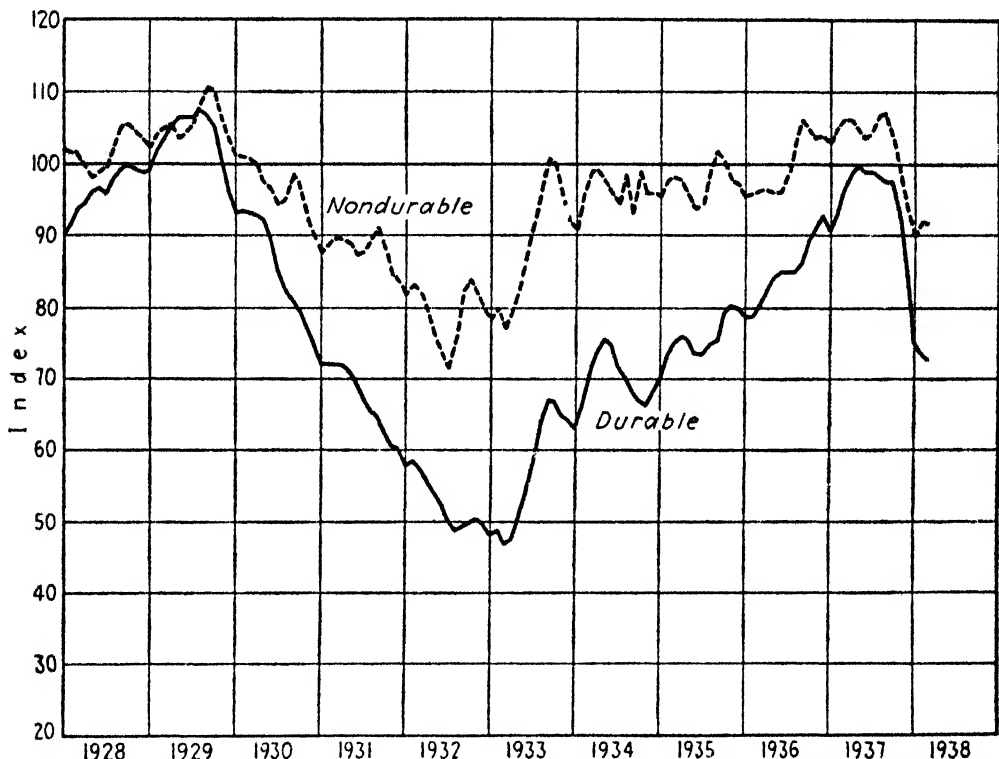


FIG. 50.—Index of employment in durable-goods and non-durable-goods manufacturing industries.²

in the demand for technical engineering services of all sorts cause unemployment among engineers. Whereas engineers indirectly contribute to technological unemployment, they are themselves the victims of cyclical unemployment. Table 60, based upon a study by the United States Bureau of Labor Statistics at the request of the American Engineering Council, shows the employment status of professional engineers during 3 years of varying business activity.

¹ The Cleveland Trust Company, *Business Bulletin*, Vol. 15, No. 1, Jan. 15, 1934.

² Bureau of Business Research, Ohio State University, and data collected by United States Bureau of Labor Statistics.

TABLE 60.—DISTRIBUTION OF ALL PROFESSIONAL ENGINEERS BY EMPLOYMENT STATUS REPORTED AT END OF 1929, 1932, AND 1934*

Employment status	Number			Percent		
	1929	1932	1934	1929	1932	1934
Grand total, United States.....	31,252	35,691	39,161	100.0	100.0	100.0
Engineering employment.....	29,051	27,787	30,299	93.0	77.9	77.4
Private†.....	22,456	19,797	20,619	71.9	55.5	52.7
Public‡.....	6,595	7,990	9,680	21.1	22.4	24.7
Nonengineering employment.....	1,969	4,290	5,523	6.3	12.0	14.1
Unemployed.....	232	3,614	3,339	0.7	10.1	8.5

* *Monthly Labor Review*, Vol. 44, No. 4, p. 861.

† Includes those engineers in the employ of private firms, independent consultants, reporting "any other employment," and teaching.

‡ Includes those engineers in the employ of federal, state, county and municipal governments, and other public authorities.

Whereas the average amount of unemployment for all reporting engineers in 1932 was 10.1 percent, in chemical and ceramic engineering it was only 8.6 percent, while in mechanical and industrial engineering it was 10.7 percent. Although unemployment in 1934 dropped to 8.5 percent for all engineering groups, it declined to 6.2 percent in chemical and ceramic engineering and increased to 10.2 percent in civil, agricultural, and architectural engineering. Had a substantial number in the latter group not been absorbed in government projects the percentage would have been considerably higher.

The Organization of the Labor Market.—The third group of causes of unemployment are those relating to an improper organization of the labor market. Much labor is bought and sold on a haphazard basis. If an employer advertises for 100 men he may find 10,000 at his gate, some of whom have come from a great distance. The men have not been preselected. Some may have given up jobs elsewhere. If an employee is laid off or discharged he may start out blindly looking for other work. Even though he hears of work elsewhere there is the inevitable waste of time in getting the man and the job together. Some of the costly labor turnover for which American industry is noted can be attributed to the lack of organization in the labor market. If employers knew more about the qualifications of the employees they were hiring, and if workers knew more about the requirements of the

jobs they were seeking, there would be fewer misfits and a smaller turnover rate.

The Effects of Unemployment.—The effects of unemployment are many. One authority summarizes them as follows:

Unsteady employment attacks the worker's efficiency in so many ways that probably no one could enumerate them all. It undermines his physique; deadens his mind; weakens his ambition; destroys his capacity for continuous, sustained endeavor; induces a liking for idleness and self-indulgence; saps self-respect and the sense of responsibility; impairs technical skill; weakens nerve and will power; creates a tendency to blame others for his failure; saps his courage; prevents thrift and hope of family advancement; destroys a workman's feeling that he is taking good care of his family; sends him to work worried and underfed; plunges him into debt."¹

Unemployment an Overhead Cost for Society.—A certain minimum requirement of food, clothing, and shelter must be provided during prosperity and depression if the efficiency of the worker is to be maintained. Thus the necessary maintenance of laborers clearly is an overhead cost for society that continues almost independently of production. Another element in labor cost is the expense of general education and specialized training, which may represent a considerable investment. Specialized training is like specialized capital; it is wasted if the possessor shifts his occupation and is partly wasted if he works short of his capacity. These investments in training are overhead costs which are not offset by social income if the laborer is unemployed.

There can be little question as to whether unemployed labor does or does not involve a social overhead cost. The real problem concerns the best distribution of the cost burden—the best form of social cost accounting. The distribution of the overhead costs of labor should no longer be left to the forces of the labor market alone. Otherwise the burden falls upon those persons financially least able to carry it. The distribution should be remodeled in the light of social justice and of the principle that burdens and incentives should be placed where they can do the most good to bring about the action that social efficiency demands. Fair social accounting would place a major part of the burden of cyclical unemployment on industry, rather than

¹ From LESCOHIER, D. D., "The Labor Market," The Macmillan Company, 1919, p. 107.

on those classes of labor least able to bear it successfully, as is the case at present.

II. PROPOSED REMEDIES FOR UNEMPLOYMENT

The proposed remedies for unemployment are legion. Many of them are mere platitudes, devoid of any economic foundation; others are revolutionary proposals for remaking the entire social system. Some remedies seek to reduce the size of the employable labor force by keeping young people in school longer and by pensioning off older people at a younger age. Other remedies would merely "spread" the existing volume of employment, such as proposals for shorter hours; although reducing hours, if accompanied by the same daily or weekly wage, is frequently advocated as a means of reducing unemployment through a redistribution of income.

Various types of subsidies to industry are sometimes urged on the theory that more employment can be given if production costs can be lowered. Still other remedies are premised upon the assumption that private industry is unable at times to provide work for all the employables, so that public work or relief work should be provided by governments to take up the slack, or production units should be established outside the business economy proper for the utilization of idle plants, idle machines, and idle workers. Finally, some remedies are limited to paying benefits to the unemployed, on the assumption either that nothing can be done to prevent unemployment and relief is necessary anyway or that the payment of out-of-work benefits will reduce unemployment through the augmentation of purchasing power and, if benefit costs are assessed upon employers in certain ways, that some stabilization of employment will result.

Unemployment Compensation.—Compensation for unemployment may be provided on a voluntary basis by labor unions or employers, by agreements between unions and employers in an industry, or on a compulsory basis through legislative action. The first and only state-wide compulsory system of unemployment compensation in the United States prior to 1935 was established in Wisconsin in 1932. Today every state in the union has a compulsory unemployment compensation plan, based upon the principle of cooperation between the state and federal governments. This rapid turn to unemployment compensation,

never equaled anywhere else in the world in the speed of its adoption, was the direct result of the passage by Congress in 1935 of the Social Security Act, which in turn was the outgrowth of the great depression.

The Social Security Act.—The Social Security Act is a comprehensive measure designed to provide economic security on a wide front. It subsidizes state old-age assistance plans, state aid plans for dependent and crippled children, and maternal and child welfare and health services. It establishes an enormous, nation-wide, contributory old-age pension plan, and it provides a way for the states to establish and operate their own unemployment compensation plans under a limited amount of federal supervision.

The Social Security Act induces the states to provide unemployment compensation by the use of a tax-credit device, whereby the federal government levies a 3 percent¹ excise tax on the total wages paid by employers subject to the act, and then permits the employer to credit against the tax the contributions (premiums) paid to his state unemployment compensation system in an amount not to exceed 90 percent of the tax. In addition, the federal government pays the costs of administering the state systems.

To obtain the tax credit and the administration expense money a state must meet such general requirements as paying all benefits through public employment offices, providing for a fair hearing in matters of dispute, immediately forwarding all contributions to the Unemployment Trust Fund in the United States Treasury, and not denying an otherwise eligible individual benefits for refusing to accept new work under any of the following conditions: (1) If the position offered is vacant due to strike, lockout, or other labor dispute; (2) if the wages, hours, or other conditions of the work are substantially less favorable to the individual than those prevailing for similar work in the locality; (3) if as a condition of being employed the individual would be required to join a company union or to resign from or refrain from joining any bona fide labor organization.²

Beyond such requirements a state is given wide latitude in the choice of acceptable unemployment compensation plans. It may

¹ The rate was 1 percent in 1936, and 2 percent in 1937.

² Social Security Act, Sections 303 and 903.

provide for separate employer reserve accounts, a pooled fund, with or without merit rating, a guaranteed employment account, or various combinations of these plans. In the language of the Social Security Act, the plans are defined as follows:

The term "reserve account" means a separate account in an unemployment fund, with respect to an employer or group of employers, from which compensation is payable only with respect to the unemployment of individuals who were in the employ of such employers, or of one of the employers comprising the group.

The term "pooled fund" means an unemployment fund or any part thereof in which all contributions are mingled and undivided, and from which compensation is payable to all eligible individuals, except that to individuals last employed by employers with respect to whom reserve accounts are maintained by the state agency, it is payable only when such accounts are exhausted.

The term "guaranteed employment account" means a separate rate account, in an unemployment fund, of contributions paid by an employer or group of employers who (A) guarantee in advance thirty hours of wages for each of forty calendar weeks (or more, with one weekly hour deducted for each added week guaranteed) in twelve months, to all the individuals in his employ in one or more distinct establishments, except that any such individual's guaranty may commence after a probationary period (included within twelve or less consecutive calendar weeks), and (B) give security or assurance, satisfactory to the state agency for the fulfillment of such guaranties, from which account compensation shall be payable with respect to the unemployment of any such individual whose guaranty is not fulfilled or renewed and who is otherwise eligible for compensation under the state law.¹

Provisions of State Unemployment Compensation Laws.—It was inevitable that the provisions of the laws should vary from state to state. Wisconsin, for example, has the employer reserve-account plan. New York has a pooled-fund plan. Indiana combined the pooled-fund and the reserve-account plans and also has a provision for guaranteed employment. California has a pooled-fund plan with merit rating. Within the general framework of the plans there are variations in coverage, eligibility for benefit requirements, and the amount and duration of benefits, and in the size of contributions, which are paid by employers in some states and jointly by employers and employees in others. Generally speaking, benefits for total unemployment are equal

¹ *Ibid.*, Section 910 (c).

to 50 percent of wages, with a maximum weekly amount of \$15 and a maximum duration of 16 weeks in any one year, and are paid after a waiting period of 3 or 4 weeks.

Unemployment Compensation and Employment Exchanges.—

One of the principal arguments in favor of an unemployment compensation plan is that it organizes the labor market automatically. Before a worker can claim benefits he must register at an employment exchange (office), and before he can be paid benefits he must prove his claim to them by taking suitable work if it is available. An employer who desires a workman with certain qualifications can apply to the exchange, with the result that the man and the job are brought together with a minimum of delay. Moreover, if the employment office officials are well trained and have the time they can give sufficient study to the qualifications of the unemployed and to the needs of the employer so that the right man is recommended for the job, thereby reducing labor turnover.

A nation-wide system of employment offices is particularly valuable in meeting a shortage of workers in one region by arranging for their transfer from another area with a surplus of workers. The United States Employment Service which, since 1933, has supplanted the National Employment Service, staffed such projects as Fort Peck and Coulee Dam, which required specialized skills that were not to be found in the vicinity. In 1936 the same service made 227,077 placements through clearance, from one section to another, of which most of the jobs involved considerable skill, such as tool designing, toolmaking and diemaking, pattern making, and gear cutting. The United States Employment Service in conjunction with state employment services forms the nucleus for a still larger system of employment exchanges necessary for the operation of the forty-eight state unemployment compensation systems.

Merit Rating and Unemployment Compensation.—The Social Security Act attempts to "regularize" or "stabilize" employment by granting *additional* tax credits to employers who qualify for reduced unemployment compensation rates. A majority of the state unemployment compensation laws, after benefits have been paid for at least 3 years, grant "merit" contribution rates to those employers who attain a certain defined standard of employment performance. These reduced rates clearly save the employer

money in respect to the state unemployment compensation systems, but when he pays less in contributions he has less credit to offset against the federal excise tax. To correct what would otherwise be an inconsistency, the Social Security Act provides¹ that the employer who gets a reduced state contribution rate shall enjoy as large a tax credit as the employer whose rate is not reduced. To illustrate, suppose in a given state practicing merit rating, one employer's rate is 4 percent (of wages) while another employer's rate, perhaps a direct competitor, is only 1 percent. The Social Security Act levies a tax on each employer equal to 3 percent of his taxable wages, against which each employer is entitled to a tax credit of 2.7 percent (90 percent of 3 percent). The net cost to the former employer is an amount equal to 4.3 percent of his wage bill; but to the latter, it is an amount equal to only 1.3 percent of his wage bill. This "differential" cost places the former employer at a competitive disadvantage. Whether the disadvantage is of sufficient importance to induce him to attempt to "stabilize" his employment will depend upon a number of considerations, including the meaning of the term "stabilization."

Employment Stabilization.—Assuming that under a plan of merit rating an employer's contribution rate should be determined by the degree of "stabilization" he achieves, how is it to be measured? To make the question more concrete should the contribution rate depend upon:

1. The *number* of workers employed during one period as compared with another?
2. The total *pay roll* during one period as compared with another?
3. The number of *man-hours* of employment given in one period as compared with another?
4. The average number of *weekly separations* in one period as compared with another?
5. The *ratio of benefits distributed to contributions paid* during a preceding period?
6. A combination of any two or more of the above measures?

Each person's idea of stabilization will depend somewhat on his general social philosophy. When jobs are scarce, should workers be put on short time so that all will have some income, or should some workers be permitted full-time work while others are

¹ *Ibid.*, Sections 909 and 910.

entirely without employment? If the former plan is followed, workers share unemployment as well as employment, and other members of society will escape a part of the burden of unemployment. If the latter plan is followed, a greater relief cost will be encountered and other members of society will have to share in the expense, the extent of which will be determined by the type of taxes used to provide relief funds.

Management's Interest in Regular Employment.—The worker, because of limited financial resources, feels most keenly the burden of unemployment. He is not the only one, however, for the employer also suffers. Irregular employment adds to the cost of accidents, occupational diseases, and labor turnover. It encourages restriction of output. When men are idle, so are machines, equipment, and buildings. Some costs go on, for interest, taxes, rent, insurance, and other overhead items must be paid. In the end these overhead items mean fewer and dearer goods for everyone when production is curtailed.

A few industrial concerns, some of which produce highly seasonal products, have been able to stabilize employment in their plants by *regularization* programs. Procter & Gamble, manufacturers of soap, by the use of storage and other devices, maintain a fairly steady output and guarantee their employees at least 48 weeks of employment a year. Other companies, such as the Dennison Manufacturing Company, makers of paper products, not only resort to production for storage in off seasons but also have added to the list of articles they produce in an effort to make the business less seasonal. The Nunn-Bush Company, manufacturers of shoes, guarantees an annual wage. The management of these and other concerns found it profitable to attempt stabilization even without the added incentive of reduced unemployment-compensation-contribution rates.

Public Works.—The payment of out-of-work benefits, whether done through an organized unemployment compensation system or a hastily devised government relief scheme, invariably raises the arguments that persons should "work for their keep" and that the public should have something to show for its expenditures. These arguments, translated into action, result in various types of so-called "relief" work and public works. Work, in which a large part of the cost is labor, may be hastily devised with a view to providing immediate employment for unemployed persons

near at hand, or more permanent projects may be planned in advance in an effort to meet definite public needs and at the same time to serve as a tonic to business generally. When funds are limited and there are many unemployed persons in need of immediate assistance the tendency is to forego permanent and useful public works in favor of relief work of varying degrees of usefulness.

The obstacles in the way of a public works program are many. The projects should be planned in advance. Unless the normal amount of public work can be deferred until a depression arrives, any increase in public work must, of course, be a net addition to the normal program which, in spite of decreased construction costs, requires an increase in public expenditures. But increasing public expenditures during a depression is a difficult matter; either taxes must be raised or the governmental unit involved must assume an additional debt. The public's desire is all in the other direction. People want their taxes reduced. They want the public debt to be reduced to save interest charges. This was clearly the situation with state, county, city, and town governments in the United States from 1930 to 1933. Whereas federal government expenditures for public works increased about \$860,000,000, the outlays by local governments for the same purpose declined about \$3,800,000,000. In other words, the accumulated shortage in public works expenditures for all governmental units was about \$3,000,000,000, the equivalent of an entire "normal" year's work.¹ Far from providing a net increase, the public works program as a whole was unable to maintain normal production.

III. REMEDIES FOR OLD-AGE DEPENDENCY

The Social Security Act attacks the problem of old-age dependency in two general ways. It establishes a federal system of contributory annuities for persons over sixty-five years of age and, through the granting of a subsidy, encourages the states to provide additional assistance for their needy aged. The two methods are quite distinct. The former provides cash benefits on a *contract* basis to all persons who have contributed to the fund in the past; the latter gives assistance to aged persons,

¹ From a study by William Stanley Parker, printed in *The Architectural Record*, May, 1937.

whether or not they were previously employed, but only if the need for assistance can be established.

Federal Annuities.—Whereas the state old-age assistance plans are financed by state taxation and subsidized through federal taxation, the federal annuities are paid for jointly by workers and employers. Through the Social Security Act, the federal government requires all employers except certain excluded ones to pay a tax on the wages of each employee receiving up to \$3,000 income per year, beginning with 1 percent in 1937 and increasing at intervals to 3 percent in 1949. To this is added a like amount which is deducted from the wages of the employee, and the whole is forwarded to the United States Treasury, where it is invested at interest and earmarked for paying annuities to eligible persons beginning in 1942.

The amount of the annuity is equal to a certain percentage of a worker's earnings while he is a member of the system. The monthly annuity is equal to:

- One-half of 1 percent of the first \$3,000 of earnings, plus
- One-twelfth of 1 percent of the next \$42,000 of earnings, plus
- One-twenty-fourth of 1 percent of earnings over \$45,000.

The monthly annuity, which may not be less than \$10 or more

TABLE 61.—SAMPLE MONTHLY ANNUITIES PAYABLE UNDER THE SOCIAL SECURITIES ACT

Average monthly earnings	Years of employment				
	10	20	30	40	45
\$100	\$22.50	\$32.50	\$42.50	\$51.25	\$53.75
150	27.50	42.50	53.75	61.25	65.00
200	32.50	51.25	61.25	71.25	76.25
250	37.50	56.25	68.75	81.25	85.00

than \$85, continues during the life of the annuitant. Refunds are provided in case the worker dies either before the annuity begins or so quickly thereafter that the total amount of the payments received is less than $3\frac{1}{2}$ percent of the total earnings on which he paid contributions. For example, a worker who earns an average annual income of \$1,200 for 30 years after 1936 and before he is sixty-five will receive, upon attaining the age of sixty-

five, a monthly check for \$42.50 for the remainder of his life. If he should die after making contributions for 20 years, his legal heirs would receive a refund of \$840. If he should die after withdrawing 10 monthly payments, his legal heirs would receive \$415.

IV. THE INDUSTRIAL INJURY PROBLEM

Industrial Injuries.—Over a long period of years war has come to be regarded as the most destructive of all agencies, the acme of things horrible. Yet the workshop in a sense is more dangerous than the battlefield. Since our country has become an independent nation, fifteen times as many persons have been killed or injured in industry alone as have been lost in the nation's battles. The losses of war loom large for a time only, but the losses of everyday accidents accumulate with monotonous regularity. A mine explosion yesterday, a broken scaffold today, a plane wreck tomorrow—each makes its contribution to the appalling number of those injured annually. The direct financial loss has been estimated at billions of dollars yearly, while the indirect loss is beyond all calculation. In addition to the financial losses are the human suffering and misery that injuries occasion, the extent of which cannot be conceived, but which taken as a whole exert a tremendous effect upon the welfare of our country. Almost twice as many persons are killed in the United States, per million of population, as in France or Japan, more than twice as many as in Great Britain, and four times as many as in Denmark.

The Cost of Injuries.—The average fatality cuts off 20 years of productive labor. This means that the country as a whole, on the basis of 19,000 fatalities per year, is deprived of 380,000 man-years of labor because of each year's fatal injuries. The serious permanent disabilities result, on the average, in a reduction in earning capacity of nearly 50 percent. This is equivalent to the loss of some 350,000 man-years of labor. The less serious injuries account for probably 3,000,000 weeks of lost labor annually. All types of injuries taken together cause an annual loss of time of more than 280,000,000 working days.

Occupational Diseases.—Workers also are exposed to disease hazards inherent in many occupations. There are some 700 trades in which the worker is a prey to disease. Among the most common of occupational disease hazards are: lead poisoning, which may result in paralysis or insanity; arsenic poisoning,

encountered in the manufacture of pigments and paints; coal and other dusts, which encourage respiratory diseases; carbon tetrachloride and benzol, encountered in the manufacture of rubber goods; and anthrax, caused by a germ present in the manufacture of leather goods and the preparation of furs. One of the occupational diseases which has attracted wide attention in recent years is silicosis, a respiratory infection contracted in mining, quarrying, foundry and metal industries. The severity of the disease is attested by the fact that the average amount of each allowable silicosis claim in Wisconsin from 1920 to 1934 was nearly sixteen times the average for all injury claims.¹

Injury Compensation.—Germany provided the first injury compensation law in 1884. Great Britain passed a somewhat similar law in 1897, and other countries shortly did likewise. The first law in the United States was passed by New York in 1910. The courts declared this law to be unconstitutional because, it was argued, the employer was obliged to pay for injuries even though he was not at fault. It remained for the New Jersey legislature to find a way out of the difficulty. In 1911 it passed a workmen's compensation law giving both employees and employers the right to accept the law at their own option. The law provided, however, that if an employer did not accept the law he could not use the common-law defenses in damage suits. In time the courts came to recognize mandatory laws, although some of the laws are still elective.

Employers' Liability.—The common-law defenses just referred to were the backbone of the employers' liability laws that governed the relations between an injured worker and his employer prior to the passage of compensation laws. The liability laws could be applied only through a court trial. The problem of the courts was to decide who was at fault, to center responsibility, and to make the guilty party assume the burden. The courts, in interpreting the liability laws, held that the employer was to provide a safe place of employment, safe tools and equipment, competent fellow workers, and adequate supervision. If he took these precautions, he was freed from the responsibility of accidents arising from (1) the worker's own carelessness, (2) the negligence of fellow workers, (3) the ordinary risks of occupation, and (4) the extraordinary dangers of particular employments.

¹ *Monthly Labor Review*, Vol. 44, No. 5, May, 1937, p. 1100.

If the employer, or the insurance company with which the employer had insured, could prove in court that the injury was due to any one of the points just mentioned, the injured worker or his dependents had little chance to receive compensation, however meritorious the claim might be. Investigations in the Pittsburgh coal and steel district during the operation of employers' liability laws in Pennsylvania disclosed the fact that in death claims over 50 percent of the families received not more than \$100 compensation each and that, in such serious injuries as the loss of an arm or a leg, awards either were not made at all or were generally limited to a few hundred dollars in each case. Today, under workmen's compensation laws, a death award of \$6,500 is not uncommon, while awards for serious non-fatal injuries frequently range from \$1,000 to \$4,000.

Scope of Injury Compensation.—Forty-six states have workmen's compensation laws. Agricultural workers, domestic employees, casual workers, and public employees in a few states are exempted from the provisions of the laws. Employers hiring less than a stipulated number of workers are exempt in a majority of the states.

The largest single group of laborers not eligible to workmen's compensation is composed of transportation workers employed in interstate commerce. Injury claims of these employees are still heard in the courts, although the claims are judged on the basis of an employers' liability law passed by Congress especially for transportation cases. This law reduces awards somewhat where workers are injured as a result of their own carelessness but they may obtain damages through court action in spite of the common-law defenses.

Disability Benefits.—All but two of the states require a minimum duration of disability as a prerequisite to the payment of compensation benefits. This "waiting period" varies from 1 day to 2 weeks, though over one-half of the states specify 1 week. Some of the states later compensate for this waiting period if the disability is found to be of sufficient duration.

There is no agreement as to what percentage of the average weekly wage shall constitute the weekly award. It varies from 50 to 70 percent for total disability, depending upon the particular state in which the accident occurs. In Connecticut it is 50 percent; in Indiana, 55; in Iowa, 60; in Michigan, 66⅔.

Some states have different percentages for different degrees of disability, for different types of injuries, and sometimes for marital status and number of children.

The benefit schedules are further complicated by the fact that all but about a half dozen of the states provide weekly maximum payments, such as \$15 or \$20 per week. In the majority of cases, these weekly maximum rates nullify the percentage provisions. Thus instead of receiving benefits equal to $66\frac{2}{3}$ percent of his wages, the injured employee is more likely to obtain an amount equal to only about 40 percent of his wages.

In all but seven states the amount which goes to the family of a man killed in industry is definitely limited. This limitation is based either on the total amount of the award, on the number of weeks during which it shall run, or on both. Thus the death award may not exceed \$5,000 in Indiana or \$3,600 in Wyoming. The maximum number of weeks during which the award may continue is 312 in Connecticut, and 285 in Delaware.

Finally, total disability benefits also are limited. In twenty-four states injury benefits for total disability cease after a given number of weeks such as 300 in New Hampshire. Moreover, there is usually a maximum limit on the total amount payable, as \$5,000 in Maryland.

Flat-rate Disability Schedules.—The majority of injuries are of the "permanent partial" type. With some exceptions, these injuries receive compensation on a prescribed flat-rate basis. That is, a fixed award is given for each injury regardless of the age, occupation, or previous training of the disabled worker.

If an Ohio worker, for example, should have his arm taken off at the shoulder, he would receive two-thirds of his average weekly wage for a period of 215 weeks, whether he is twenty years of age or sixty years of age, or whether he is a laborer or a skilled mechanic. The amount of the award is qualified by the inclusion in the law of the provision that the maximum weekly award shall not exceed (1) $66\frac{2}{3}$ percent of his average weekly wage, or (2) a total of \$18.75. This means that if a skilled mechanic who received \$45 per week were to be injured, his weekly award would not be $(66\frac{2}{3} \times \$45)/100 = \30 , but only \$18.75.

The study from which Table 62 was derived also showed two significant facts. First, the older a worker is, the greater, on the average, will be his loss of earning power resulting from any

TABLE 62.—AVERAGE LOSS OF EARNING POWER AND WEEKS' AWARD FOR SELECTED INJURIES*

Type of injury	Number of cases	Loss of earning power		Award	
		Per-cent	Index (arm = 100)	In weeks	Index (arm = 100)
Arm.....	127	46.6	100.0	200	100.0
Leg.....	87	54.9	117.8	175	87.5
Hand.....	180	36.2	77.7	150	75.0
Foot.....	104	40.1	86.1	125	62.5
Eye.....	98	17.4	37.3	100	50.0
Fingers.....	127	20.6	44.2	78	39.0
Thumb.....	53	4.3	9.2	60	30.0
Minor.....	44	2.6	5.6	27	13.5
All types.....	820	31.6	67.8	127.7	63.85

* BOWERS, E. L., "Is It Safe to Work?" Pollak Foundation for Economic Research, 1930, p. 45.

particular injury. The average loss of earning power for persons under thirty years of age is only about one-half of what it is for those over fifty years of age. Second, unskilled workers suffer a greater loss of earning power than skilled workers. On the average, unskilled workers sustain a loss from serious injuries of 54 percent of earnings, while skilled workers lose only 22 percent.

The Prevention of Industrial Accidents.—The Committee on Elimination of Waste in Industry, of the Federated American Engineering Societies, came to the conclusion that:

Experience indicates, and authorities agree, that 75 percent of this accident loss could be avoided. This would mean a saving of \$250,000,000 yearly to employers, and a saving of \$500,000,000 yearly to employees.¹

Since the number of accidents shows little if any decrease year after year, except when the number of workers is greatly reduced through unemployment, the insistence on the part of recognized authorities that the accident rate could be sharply reduced invites inquiry as to more effective means to prevent deaths and injuries.

Some companies *have* reduced their accident rates. For example, the Oliver Iron Mining Company reduced its accident

¹ "Waste in Industry," 1921, p. 332.

rate 73 percent in 1 year. The Bethlehem plant of the Bethlehem Steel Company reduced the number of days lost per worker because of accidents 65 percent in 1 year. The Westinghouse plant in Pittsburgh operated 59 years with only twelve fatal accidents, and Henry Ford has operated his huge Highland Park plant for as long as a year without a single fatal accident.

Workmen's Compensation Laws and Accident Prevention.—

When workmen's compensation laws first were passed, it was expected by some persons that they would reduce accidents to a negligible number. This anticipation has not been realized. The supposition was that the safe firm would have lower rates than the unsafe firm. Premiums were to be determined on a merit basis in either of two ways. One way would be by means of *schedule rating*, which starts with a given basic rate, as \$1 for each \$100 of pay roll. The basic rate is then moved upward as the employer fails to comply with the physical safety standards required and is moved downward as he complies with these standards or takes additional positive steps to reduce accident hazards still further. *Experience rating* differs from schedule rating in that it is based upon known past, rather than upon expected future, performance. The basic rate is the minimum rate until the injury experience of the plant is known. Future premiums then will be "corrected" to make them harmonize with the plant's actual injury record.

Even on a merit basis the compensation system has not been able to reduce injuries to the desired level. The cost of insurance premiums averages about 1 percent of the sales price of the article produced. By merit rating this average may be increased to about $1\frac{3}{4}$ percent or lowered to three-fourths of 1 percent. This variation is insufficient to overcome the cost of other factors which tend to increase the number of accidents.

V. THE ILLNESS PROBLEM

The illness problem is accentuated by the fact that the costs of medical care and loss of wages are unevenly distributed and unpredictable. The Committee on the Costs of Medical Care found¹ that whereas 80 per cent of families in low-income groups kept their medical service costs under \$60 a year, 2.5 percent

¹ Committee on the Cost of Medical Care, *op. cit.*, pp. 16 and 17.

were charged between \$250 and \$500 a year, and 1 percent were charged over \$500 per year.

The leading foreign countries have established far-reaching plans for dealing with sickness. In Germany, for example, after the third day of sickness, half wages are paid for a period not to exceed 26 weeks. Employers pay one-third and workers two-thirds of the cost, and the government meets certain administrative expenses. In Great Britain all manual workers between the ages of sixteen and seventy are provided with sickness insurance, three-fourths of the cost of which is met jointly by the employers and employees, while the remainder is paid by the government. The worker may insure in a friendly benefit society, a trade union, or a private company.

Until a few years ago, the only concerted action in the United States to provide financial assistance during periods of illness was found in fraternal and trade union sickness funds, special benefit schemes of a relatively few corporations, and sickness policies issued by insurance companies. Recently, a number of group hospitalization plans have been started, whereby in return for a fixed monthly or annual contribution a group of physicians associated with a clinic or hospital agrees to provide a designated amount of medical service to an individual or a family. A number of health insurance bills have also been under consideration by state legislatures. Most of them provide for joint contributions by employers and employees and provide for dual benefits—limited medical fees and maintenance funds during illness, both for the insured worker and for members of his family. The movement for health insurance of some sort is growing steadily.

Problems

159. Newspaper item: "Three men killed in factory explosion; company is not held to be negligent." On the basis of this case, show that workmen's compensation insurance is better than employers' liability for *both* worker and employer.

160. The X corporation employs 1,000 men in its farm-implement factory. It installs new machines, discharges 500 workers, and at the same time increases its profits \$200,000 per year.

a. Should the X corporation be held responsible for the welfare of the 500 unemployed workers?

b. Should the X corporation share its increased profits with the displaced workers? With the men still employed?

161. "Any company could avoid laying off its workmen if it could sell its products at lower prices. Therefore it is in the interest of the social welfare that the government subsidize certain firms so that their labor forces may continue without suffering unemployment." Discuss.

162. X, who will be twenty-five years of age in 1940, goes to work in 1940 for Y motors, a company covered by the federal old-age pension system. X retires at sixty-five, after being continuously employed by Y motors at an average annual salary of \$3,000.

a. Compute X's monthly pension.

b. What total sum will he have received if he dies at eighty years of age?

c. What sum will his family receive if he dies at sixty years of age?

163. Contrast the method of helping people on a needs (means) test basis with the method of paying them benefits "as a matter of right," in respect to:

a. First cost in money.

b. Long-run total cost.

c. Encouragement to thrift.

d. Difficulties of administration.

164. "A guaranteed annual wage (i.e., \$25 per week for 50 weeks—it need not be the same for every employee, employer, or industry) is the 'best' solution to the problem of unemployment." Argue pro or con, indicating particularly just how the plan would or would not work.

165. What are the effects of the introduction of machine methods upon wages and the volume of employment? Are engineers partly responsible for technological unemployment? Should we not have a 10-year moratorium of invention and machine development to allow employment to catch up with science?

References

BEVERIDGE, SIR WILLIAM: "Unemployment: A Problem of Industry," Longmans, Green & Company, 1930.

BOWERS, E. L.: "Is It Safe to Work?" Pollak Foundation for Economic Research, 1930.

Committee on Economic Security: "Social Security in America," Social Security Board, Washington, D. C.

DOUGLAS, PAUL: "Social Security in the United States," McGraw-Hill Book Company, Inc., 1936.

EPSTEIN, ABRAHAM: "Insecurity—A Challenge to America," rev. ed., Random House, 1936.

FELDMAN, H.: "Regularization of Employment," Harper & Brothers, 1925.

FISHER, ALLAN: "The Clash of Progress and Security," Macmillan & Company, Ltd., 1935.

MILLIS, HARRY A.: "Sickness and Insurance," University of Chicago Press, 1937.

STEWART, MAXWELL: "Social Security," W. W. Norton & Company, Inc., 1937.

WYATT, BIRCHARD E., and WILLIAM WANDEL: "The Social Security Act in Operation," Graphic Arts Press, 1937.

CHAPTER XXV

PUBLIC EXPENDITURES AND TAXATION

That public expenditures and taxation are problems which every society must face is illustrated by the old adage that "nothing is certain but death and taxes." This belief in the inevitability of taxes, well founded as it is, is in part responsible for the general lack of understanding on the part of most people concerning the nature of public expenditures and the efficiency and justice of the tax system. Many persons in the lower income groups are the victims of this lack of understanding. They are inclined to believe that they benefit greatly from government expenditures without paying much in return, while the rich are assessed heavily for these expenditures. This is far from true, however. Every time a person buys a package of cigarettes, for example, he pays from 6 to 8 cents in taxes—more than four times what the farmer gets for the tobacco; several times more than labor gets for making the package; frequently half of the whole price. Every time one uses motor transportation facilities he pays a tax—3 to 8 cents a gallon on gasoline.

The problems of public expenditures and taxation are of vital concern to everyone. On an average, every person in the United States pays about \$100 a year in taxes; in 1936 a total of perhaps \$12,500,000,000 was collected by the federal, state, and local governments, an amount equal to about one-fifth of the total national income.

As was pointed out in the first chapter, the advances in technology have changed the United States from an agricultural to an industrial economy. Accompanying this change has been a corresponding shift in importance and power away from local governmental units to the state and federal governments. This shift has left us with some 175,000 different taxing and spending jurisdictions in our governmental structure. The pressing problem now is to decide what functions should be performed by government and by what units of government. This chapter

will be concerned with the growth in public expenditures and the necessity for them, with the various federal, state, and local revenue systems and with some of their implications for economic life.

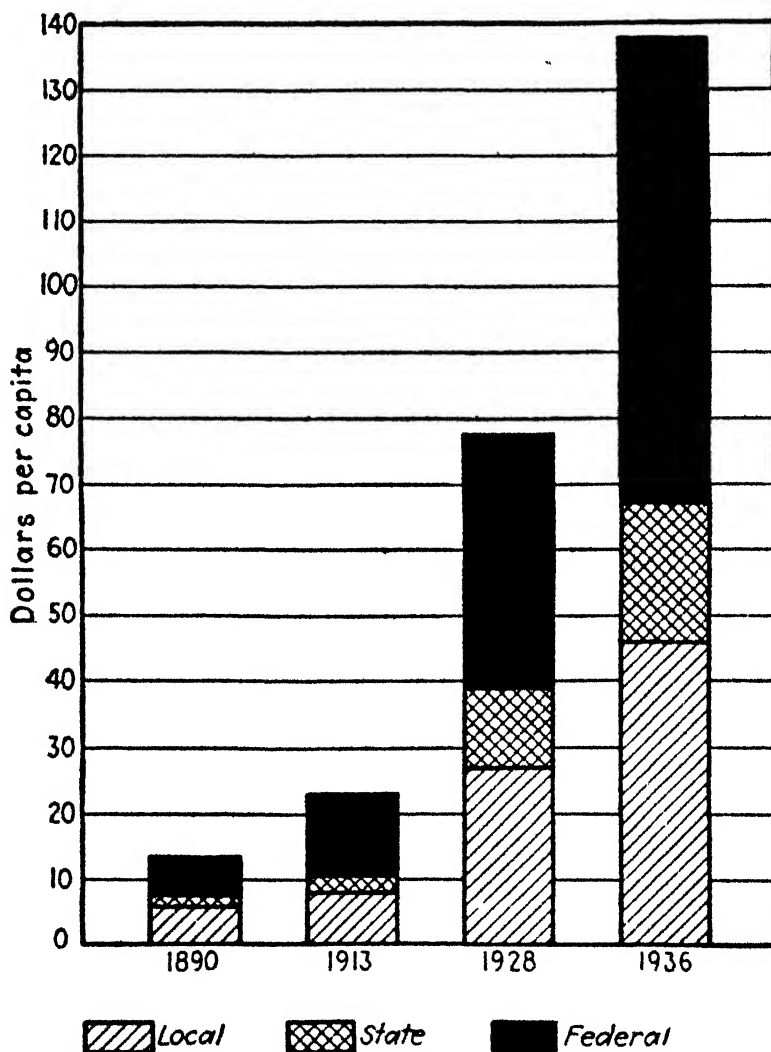


FIG. 51.—Comparative per capita expenditures of local, state, and federal governments for selected years.¹

I. PUBLIC EXPENDITURES

Increase in Public Expenditures.—Some conception of the steady increase in public expenditures may be obtained from Fig. 51. The per capita expenditure for 1936 was almost twelve times that in 1890. This increase has been most marked in the

¹ National Industrial Conference Board, "Cost of Government in the United States," 1930; Twentieth Century Fund, Inc., "Facing the Tax Problem," 1937.

case of federal and state governments, each one spending about fourteen times as much per capita as in 1890. Local governments spent about nine times as much per capita in 1936 as in 1890. The greatest increase in recent years, however, has been in federal expenditures. These increased from about \$40 per capita in 1928 to about \$70 per capita in 1936. The next largest increase occurred in local expenditures, which advanced from \$26 per capita to \$46 per capita in the same period. State expenditures, on the other hand, increased from \$13 to \$21 per capita in this period. These increases in expenditures, it should be noted, are not adjusted for changes in price levels.

Causes of Increase in Public Expenditures.—Although a small part of this great increase in public expenditures may be attributed to inefficiency and corruption in the handling of public funds, most of it is due to the great increase in the number and cost of the functions which the government performs for its citizens. Some of these functions, such as emergency relief, probably are of a more or less temporary nature, but the majority are permanent activities whose number and magnitude may be expected to increase rather than diminish as time goes on. A large proportion of the increase in state expenditures between 1890 and 1936, for instance, was due to the invention of the automobile, with the consequent need for roads, bridges, safety measures, and other facilities. The increased demand for education is another significant factor in the rise in expenditures.

The additional functions demanded of government depend on the degree of concentration of population. A city of 500,000 not only demands all the services that one of 100,000 requires but also a number of others. Whereas the average government cost in 1936 of cities in the United States with from 100,000 to 300,000 inhabitants was \$44.13 per capita, the cost for cities with from 300,000 to 500,000 inhabitants was \$66.27, and for cities with more than 500,000 inhabitants, the per capita cost was \$79.12.

Since 1932 an increasingly large proportion of the expenditures of the federal government has gone for "recovery and relief" purposes. So important has this new type of expenditure become that it accounted for over half of all federal expenditures in 1934. Nevertheless it is well to keep in mind that so-called "depression" expenditures usually fall far short of war expenditures. In the period from 1917 to 1919 the United States government spent

**TABLE 63.—FEDERAL GOVERNMENT RECOVERY AND RELIEF EXPENDITURES
STATED AS A PERCENTAGE OF TOTAL FEDERAL GOVERNMENT
EXPENDITURES, 1932-1936***

Year	Recovery and relief expenditures (in thousands)	Percentage of total expenditures
1932	\$ 892,735	17.3
1933	1,276,796	22.8
1934	4,002,398	56.3
1935	3,656,530	49.5
1936	3,290,928	35.2

* "Statistical Abstract of the United States," 1937, p. 166.

about 30 billion dollars, principally for war purposes, an amount nearly three times as great as the expenditures for recovery and relief purposes in the period from 1934 to 1936.

War Expenditures.—A large proportion of federal expenditures, other than those for recovery and relief programs, is for war purposes. In 1937 the war and navy departments spent \$628,348,000 and \$556,884,000 respectively and still greater expenditures were undertaken in 1938 and planned for 1939. Interest on the public debt, a part of which is attributable to past wars and to preparation for future wars, amounted to \$866,384,000. The Bureau of Pensions and the Veterans' Administration spent \$1,137,310,000, of which \$556,665,000 were Adjusted Service Certificate Fund payments. Year after year, war consumes upward of 75 percent of all ordinary (as distinguished from recovery and relief) expenditures.

TABLE 64.—EXPENDITURES, REVENUES AND DEFICITS OF THE FEDERAL GOVERNMENT, 1931-1936*

Year	Expenditures	Revenues	Deficits
1931	\$4,092,000,000	\$3,190,000,000	\$ 902,000,000
1932	5,154,000,000	2,006,000,000	3,148,000,000
1933	5,143,000,000	2,080,000,000	3,063,000,000
1934	7,105,000,000	3,116,000,000	3,989,000,000
1935	7,376,000,000	3,800,000,000	3,576,000,000
1936	8,879,798,000	4,115,956,000	4,763,842,000

* "Statistical Abstract of the United States," 1937, pp. 163-164.

Federal Deficits and the Growing National Debt.—Not since 1930, when a relatively small surplus of 173 million dollars was realized, has the federal government collected revenues in excess of expenditures. The federal government, and some of the state and local governments, faced with increasing demands for more and more expenditures, and being unable to increase tax revenues in the same proportion, were obliged to finance deficits through borrowing. Figure 52 shows the rapid rise in the national debt in 1917 due to war demands; the gradual decline in the debt from 1919 to 1930, as prosperous business conditions permitted heavy tax collections; and the resumption of debt growth

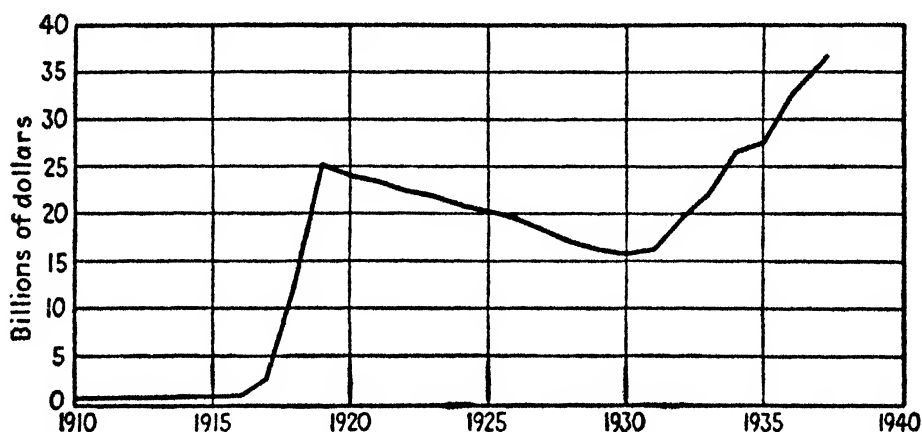


FIG. 52.—United States interest-bearing debt outstanding.¹

in 1931, as the depression simultaneously reduced revenues and increased expenditures.

Economic Effects of Government Borrowing.—When a government borrows funds to defray part of its expenses, sometimes the complaint is raised that in so doing it is “saddling future generations” with the burden of the debt. This is clearly the case when funds are borrowed abroad and repaid by the children of today’s spenders. Future generations also feel the effects of debts when the money is borrowed at home. In another sense, however, the *cost* of expenditures is met prior to or at the time the money is spent by the government. When the debts are repaid in the future, the bondholders receive money from those who pay taxes. Thus there is a *redistribution* of income, but not a *diminution* in income, unless government spending is less effective than private spending.

¹ “Statistical Abstract of the United States,” 1937, p. 200; *Federal Reserve Bulletin*, April, 1938, p. 310.

Although the cost of a war or of a depression may be borne by those who live at that particular time and is not passed on to future generations, there is considerable difference in the economic effects of government borrowing during a period of war and during one of economic depression. In a period of war the money is used to buy instruments of war which are destroyed in the process of conducting the war. Men and materials are diverted to the construction of goods which probably will be destroyed in military operations. In a period of economic depression, however, men and materials usually are not diverted from their ordinary occupations by government expenditures but, except in the case of direct relief, they are put to more or less productive work, and the resulting buildings, bridges, parks and so on, may be regarded as so much additional national wealth.

Nevertheless the large and growing national debt is causing no end of discussion. Some persons feel that although the debt is very large, it is still smaller, comparatively speaking, than the debts of most other countries and that, once a genuine wave of prosperity appears, a rising national income will make possible a sharp reduction in the amount of the debt, such as occurred in the decade ending with 1929. Other persons, on the contrary, point out that despite fairly good economic conditions in 1936 and the first half of 1937, little progress was made toward "balancing the budget," which is a prerequisite to debt reduction. They contend that the debt will become so large that the government's credit eventually will be impaired and that resort will be had to various inflationary measures; that if the debt cannot be reduced *absolutely* it can *relatively*, through the device of raising prices while the debt structure, at any given period of time, is a fixed number of dollars. In other words, it is contended, the government will be obliged to join other debtors in their advocacy of cheap money.

Since the size of any government debt depends upon two variables, expenditures and revenues, the future trend in the amount of the debt will necessarily depend upon the income yield from existing taxes, the possibility and desirability of devising new revenue measures, the demand for government services in the future, and the extent to which the government is willing to meet this demand. In the final analysis, the public debt ques-

tion is governed by what the voters feel to be the proper activities of government, which are reflected in the control of public expenditures.

The Proper Activities of Government.—In any form of government, and especially in a democracy, it is necessary that the electorate take an active and intelligent interest in the problem of public expenditures. Most people, however, tend to be less concerned with determining what activities of government may properly be expanded or what additional activities may be undertaken than with reducing the cost of the existing activities or eliminating certain activities altogether. While the problem of economy is important and must not be forgotten, it should not be pursued so far that necessary and beneficial services are discontinued or impaired. It is very difficult, however, to determine just what governmental services and functions are necessary and how far they should be carried. Certain functions, such as police protection, public health services, highways, and education are generally conceded to be the province of government. Others, such as relief, social insurance, minimum wages, or maximum hours, are believed by some to be no concern of the government. Among those who favor such activities on the part of government, there is considerable difference of opinion as to whether they should be undertaken by the federal government or by the individual state governments, although the trend is toward an increase in federal government activity.

While no adequate test for the proper activities of government has yet been devised, the problem may be considered from the standpoint of diminishing utility. One might say that money should be diverted to governmental use as long as the net satisfaction derived therefrom is greater than it would be if the expenditure remained in private hands. On this basis, governmental expenditures should be so arranged that approximately the same satisfaction is derived from the last unit of expenditure in all activities. Both these tests admittedly are hard to apply with any degree of accuracy. This is true because no absolute measures of utility or satisfaction exist. In spite of this difficulty, however, voters and legislators constantly are being called on to decide whether expansion of governmental activity in one or more directions is desirable. The increasing specialization of industry and the consequent concentration of population con-

tinually create new social problems which seem capable of solution only by collective action. In addition to these new problems, there seems to be an increasing conviction on the part of many people that society is responsible for conditions which formerly were the concern of individuals. Thus the problems of unemployment and old-age dependency are now in this category, whereas a few years ago there was little attempt on the part of governmental units (other than local relief agencies) to provide relief for those adversely affected.

The Control of Public Expenditures.—A member of Congress is said to have stated his policy regarding taxation and expenditure as follows: "I never vote against an appropriation bill or for a tax bill." This is typical of many people's attitude toward public funds—they want the benefits of government services and want to see them enlarged, but they do not want to pay for them. With the increasing emphasis on social legislation and the need for the extension of governmental activities, it must be kept in mind that these added activities must be paid for out of taxation. The government cannot continue indefinitely to meet its "emergency expenditures" by borrowing; it must balance its budget eventually and begin redeeming its debt.

One of the significant problems in an advancing society is to know when to undertake new functions and to dispense with the old. Dispensing with the old is difficult in a governmental system run on the basis of patronage. Although many people see that many governmental divisions and functions necessary in an agricultural economy, such as the township and its officials, are unnecessary with modern means of communication and methods of living, yet they are reluctant to take steps to dispense with them. A set of "vested interests" which is difficult to eliminate grows up with the jobs. One of the most fruitful fields of reform for the engineer is in local government. He is an expert in efficiency and can point out ways of economizing by combining functions and divisions.

II. TAXATION

Funds to carry out governmental programs may be obtained in several different ways. The government may print its own money (only the federal government may do this), it may borrow

money, it may operate certain industries and secure profits from them, it may collect specific charges (fees) for certain services, or it may resort to taxation. No matter which way is used, however, the people pay in the end, the only difference being that these methods do not affect all economic groups in the same way. When a government resorts to printing money to defray its expenses, for instance, it competes with the rest of the people for the products and services which it requires. In so doing it raises the prices of those goods and forces its citizens to pay higher prices than otherwise would be necessary. Those affected by the higher prices contribute indirectly, but just as effectively, to the support of the government as if they had been taxed in the first place. While government borrowing usually means that taxation is deferred until the future, it may also, as will be indicated in a later section, affect the income of the people at the time the borrowing occurs. At the present time, very little revenue is secured by any of the divisions of the government of the United States through operating industries. A few localities derive some net income from operating public utilities but, with the exception of income from municipally owned water works, the amount is insignificant. The most important source of public revenue is taxation.

A tax is a compulsory contribution or payment to defray the expenses of governments undertaken in the common interest, usually imposed without reference to special benefits and sometimes levied for non-revenue purposes. Taxes used for non-revenue purposes may not produce any revenue if the object of the government in levying the tax is to prohibit something. For example, a high protective tariff duty may have been designed to prohibit the importation of foreign goods. Again, a tax may be used as an instrument for social control and other non-fiscal purposes. For example, the federal taxing power is being used to induce the states to collect death taxes and to levy contributions for unemployment insurance. Since taxes usually are levied without special reference to the benefits obtained, it is inevitable that there are differences of opinion concerning the justice of any tax. The problem of a governmental unit with regard to taxation is to devise a system which will provide the necessary revenue with a minimum of collection expense and which will be as equitable as possible.

A Balanced Tax System.—The type of tax system which a governmental unit must adopt depends primarily on the nature of its expenditures. Government expenditures are sometimes of such a nature that they cannot be reduced during periods when the burden of taxation is apt to be greatest. In a period of economic depression, for example, governments find that new expenditures, such as those for unemployment relief, may outweigh any savings in regular expenditures. If one type of governmental unit does succeed in reducing total expenditures, as was true of local governments after 1930, it may do so in part only at the expense of other governmental units. Thus some of the burden of relief expenditures was transferred from local to state governments and later to the federal government. The first requisite of any tax system is that it produce revenue when needed.

In addition to producing revenue as needed, a sound tax system should be economical to operate; it should be as simple in structure as possible; the amount which a person is to pay in taxes should be known definitely and not subject to whim; and the time and place of tax payments should be convenient for the taxpayer. With the growth in public expenditures, another principle of taxation, that of equity, has become increasingly important. To say that a tax system is equitable means that the burden of taxation is distributed over the population according to some generally accepted standard of justice and fairness. Some of these standards will be discussed in the next section.

Frequently there is a conflict between the principles of justice and fairness and the necessity for additional revenue. Certain taxes, such as the income tax, are considered very just, but do not yield a steady stream of revenue, and may yield the minimum amount when the need is greatest. A balanced tax system must supplement such taxes with others which will maintain the total volume of revenue at the desired level. Largely as a result of the depression beginning in 1929 general sales taxes have been adopted in over half the states. While the sales tax is one of the most inequitable taxes, it does have the advantage of yielding a large revenue with relatively small administrative costs.

Distribution of the Burden of Taxation.—Discussion of principles of justice and equity in distributing the burden of taxation

usually centers around two principles: the *benefit* principle and the *ability-to-pay* principle. The benefit theory maintains that taxes should be imposed in accordance with the benefits received from public expenditures. Thus one who benefited greatly from the services of government would pay a large amount in taxes, and one who received few benefits would pay only a small amount. While this principle seems fair, it is almost impossible to apply it in practice. The first difficulty is that it is not easy, if at all possible, to measure the relative benefits which the different members in a governmental unit receive from its operation. The second difficulty is that even if benefits could be determined, those who receive the greatest benefits might be unable to pay for them, while those who receive the least benefits might be better able to perform the services themselves. As a result of these difficulties, the benefit principle is used very little in determining the distribution of taxes.

The second principle, that of *ability to pay*, is the most commonly accepted one. This principle seems relatively simple, but actually it is not, because it is difficult to measure accurately the ability to pay. What should be the test of ability? The test first applied was that of *property*. This was satisfactory as long as most people derived their incomes from property. As the industrial system developed, however, an increasingly large proportion of the people began to secure large incomes without holding property. This was especially true of the professional classes and those having executive positions in corporations. The growth of the corporation also brought an increasing amount of *personal* property as distinct from *real* property. Personal property, being movable, was not easily assessed and was frequently concealed. Intangible personal property in the form of stocks, bonds, mortgages, and so on, often yielded large incomes. As a result of these developments, income as a measure of ability to pay taxes has been receiving increasing attention from economists and government officials alike.

One's income alone, however, is not an accurate indication of his ability to pay taxes. A bachelor with a \$25,000 a year income is more able to pay taxes than a married man with five children who has the same income. Even if the two men had families of the same size, but one received \$25,000 as income from property and the other from working as manager of a plant, their ability

would not be equal. The first man would be under little or no obligation to provide for his future, while the second would.

If one accepts the ability-to-pay principle, the question of justice is not settled until some measure of *relative* ability is decided upon. Is a man with an income of \$100,000 ten times as able to pay taxes as one with an income of \$10,000? In practice, this problem is compromised by *progressive* taxation. Progressive taxation rests on the assumption that as one's income increases, his ability to pay taxes increases more than proportionally; but how much more is, and probably will remain, a matter for debate. This principle of progressive taxation may be seen in the federal income tax.

The Federal Personal Income Tax.—To determine the annual taxable net income, the federal personal income tax law first permits a personal exemption from gross income of \$1,000 for a single person and \$2,500 for a married couple or the head of a family. For each dependent¹ an additional exemption of \$400 is permitted. Thus a husband and wife with two children could claim an exemption of \$3,300. For purposes of the *normal* tax, there is permitted an additional *earned income* (income derived from personal efforts rather than from investments) exemption equal to 10 percent of earned income not exceeding \$14,000 per year. If the family above had an income of \$5,000 a year, the earned-income exemption would be $\$170 = (\$5,000 - \$3,300 \times 10 \text{ percent})$. The total tax payable to the government would be $\$61.20 = (\$5,000 - \$3,470 \times 4 \text{ percent normal rate.})$ This particular family is not required to pay a *surtax*, because the net income to which this part of the tax is applied excludes the \$3,300 personal and dependents' exemption and an additional exemption of \$4,000, which would not make the surtax applicable unless the total net income after all exemptions was in excess of \$7,300. For those families and persons with incomes high enough to be charged the surtax, the rates run from a low of 4 percent on surtax net incomes from \$4,000 to \$6,000 per year to a high of 75 percent on that part of the surtax net income in excess of \$5,000,000 per year.

The Taxing of Profits.—In 1917 an excess profits tax was levied to enable the government to augment a much needed emergency income from rising profits due to war activity. Although the tax

¹ A dependent is a person under eighteen years of age or one incapable of self-support on account of mental or physical deficiency.

proved to be an important source of revenue it was repealed in 1920, and it was not until 1933 that another excess profits tax law was passed. This tax has produced very little revenue, largely because corporations "have preferred to set a relatively high value on their stock, thus paying a substantial capital stock tax but avoiding the excess profits tax."¹

Partly as an important new tax revenue measure, partly "as an instrument of social reform which would permit the government to attack the weighty problems of economic instability, corporate abuses, and inequalities of income taxation,"² Congress in 1936 passed the highly controversial *undistributed profits tax*. This tax was levied on the profits of corporations which were not distributed to stockholders during the year in which they were earned. The rates were *progressive* and ranged from 7 percent on that part of the undistributed net income not in excess of 10 percent of the net income, to 27 percent on that part in excess of 60 percent. The 1938 Revenue Act levies what is in effect³ a flat 16½ percent tax on all corporation profits plus only a 2½ percent surtax on profits which are not distributed. Although the act reduced the taxes on undistributed profits, it increased the taxes on *capital gains*, i.e., gains from the sale of such assets as securities and real estate, not held for sale in the ordinary course of business.

The undistributed profits tax has created no end of argument and misunderstanding. The proponents of the tax have con-

¹ Twentieth Century Fund, Inc., "Facing the Tax Problem," 1937, pp. 491-492.

² BUEHLER, ALFRED G., "The Undistributed Profits Tax," McGraw-Hill Book Company, Inc., 1937, p. 3.

³ Actually, the tax for corporations with large incomes is computed as follows: "The adjusted net income is first computed by deducting from the net income any interest received on government bonds. A tentative tax is then determined by taking 19 percent of the adjusted net income. From this tentative tax is then deducted the sum of (a) 16½ percent of 85 percent of the amount of dividends received from domestic corporations, and (b) 2½ percent of the amount of dividends paid and other so-called dividends paid, credit items provided in the Act, but not to exceed 2½ percent of the adjusted net income. . . . Corporations with net incomes of \$25,000 or less are treated as special class corporations and are taxed at graduated rates which are lower than for corporations reporting larger incomes."—From DONALDSON, ELVIN F.: "Business Organization and Procedure," McGraw-Hill Book Company, Inc., 1938, Chap. XIII.

tended that its purpose, aside from the additional revenue which it yields, "is to put corporate stockholders on the same income basis as partners or individual owners of business concerns."¹ Further, that the forced distribution of earnings is necessary if "an equilibrium between productive capacity and purchasing power—that is, between saving and spending—is to be maintained."²

The critics of the undistributed profits tax, among whom are most of the country's leading tax experts, take exception to this type of tax on many grounds. They deny most of the underlying assumptions of the tax, particularly the one which attributes depressions to the failure to transfer profits to stockholders, who are alleged to spend the money quickly as consumers. On the contrary, the opponents of the tax argue that if corporations are not permitted to pile up large reserves in good times and are forced to distribute earnings as they are created, the result will be to intensify future depressions with an increase in hardships for everyone.

The Federal Revenue System.—The most important sources of tax revenue of the major divisions of government in the United States (federal, state, and local) for 1937 are shown in Fig. 53. By far the most important source for the federal government is the income tax, both on corporation incomes and on personal incomes. Next in order of importance are the taxes on liquor and tobacco. These are followed by the pay-roll tax and customs. That portion of the pay-roll taxes which represents unemployment insurance premium payments, however, is returned to the various states, except for the amount necessary to administer the social security program (see Chap. XXIV). While receipts from customs make up only a small part of the federal revenue at the present time, they were almost the only form of revenue during the first years of the government's existence. Death taxes, together with gift taxes, are a means of redistributing wealth as well as of securing revenue.

Of the various federal taxes, the income tax conforms most closely to the requirements of a sound and fair tax. The taxes on tobacco, liquor, and gasoline, while simple and easy to collect, are regressive taxes in their effects and bear most heavily on

¹ "Facing the Tax Problem, *op. cit.*, p. 464.

² *Ibid.*, p. 469.

those with low incomes. Since the income tax is the most important single source of revenue (yielding over 30 percent of the total federal revenue), the federal tax system is not sufficiently elastic to provide for the increase in funds required by a period of

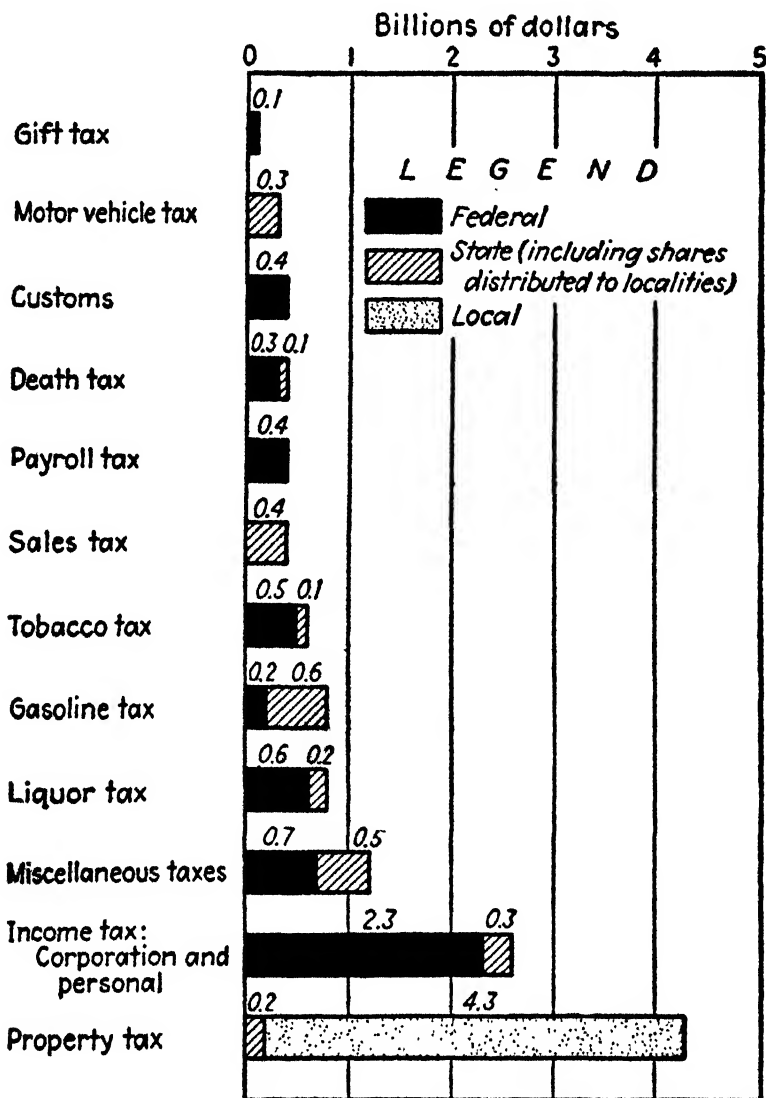


FIG. 53.—Sources of tax revenue in the United States, 1937.¹

economic depression. As a result, the government was forced to borrow during the depression beginning in 1929.

Tariffs consist partly of protective duties and partly of revenue duties. Tariff duties may be so high as to prohibit importing, or just high enough to prohibit some importing, in which case protection and revenue can be combined.

¹ "Facing the Tax Problem," *op. cit.*, p. 11.

State Revenue Systems.—One of the most significant features of state taxation systems for the engineer is the proportion for which the automobile is responsible. If motor vehicle taxes and gasoline taxes are combined, they form the largest single item in state revenues. While the automobile has greatly increased the expenses of state governments with the need for roads and traffic control, it has also provided more than enough revenue for these purposes. Next to the taxes on motor vehicles and gasoline, the sales tax is the largest source of revenue. It is significant that income taxes account for only a small proportion of state revenue.

State tax systems are generally regressive in nature, with the exception of the income tax. The taxes on motor vehicles and gasoline are thought to be quite fair as long as the money is spent for roads and other purposes of benefit to motorists. As a matter of fact, however, the use of these taxes for non-highway purposes may be equally justifiable, since the taxes disregard the ability-to-pay principle anyway. The general sales tax, as was pointed out in an earlier section, is a regressive tax in its effects, even though the rates are not regressive. The sales tax can be made less obnoxious to those with small incomes if basic necessities are exempted or if the tax is limited to selected commodities which are purchased mainly by persons with higher incomes.

Local Revenues.—As is indicated in Fig. 53, almost all local revenues are derived from property taxes. This is a carry-over from the early part of the country's history. When the country was settled and developed and units of government established, the local units of villages, townships, and counties were the most important, and property in land was the only available source of revenue. One of the important problems facing people at the present time is that of overhauling and modernizing local government structures and tax systems. While it was necessary to have small governmental units with independent taxing powers when the nation was chiefly agricultural, this need has long since passed and few of these units now serve a useful purpose. One of the most fruitful fields for practical economic reform today is that of consolidating local governmental units.

The Shifting and Incidence of Taxation.—Some taxes are direct; others are indirect, the burden being shifted to a second, third, or even fourth party. It is sometimes difficult to deter-

mine who actually pays a tax. Yet the question of "incidence" is extremely important, because it indicates who actually is meeting the government's expenses. A tax may be levied upon one group, only to be shifted to another, contrary to the expectations and hopes of the lawmakers.

During the World War the federal government levied a progressive excess profits tax on corporations. When the war was over, the tax was removed because there was a strong sentiment against it. One of the arguments advanced in favor of its removal was that such action would correspondingly lower prices to the consumer. The repeal of the tax was advocated, for example, because it was claimed that this action would enable automobile manufacturers to reduce the price of automobiles.

This conclusion does not coincide with the analysis of price determination given in earlier chapters. Automobile prices, like other prices, will drop because of an increase, or expected increase, in the supply or because of a decrease in the demand. An excess profits tax will have no effect upon demand. Will it affect supply? It will not put non-profit-making concerns out of existence. If a concern making profits were to curtail operations, it would not be obliged to pay so much in taxes, but its remaining profits after paying the smaller tax would be reduced still further. Generally speaking, therefore, *an excess profits tax cannot be shifted*. Such a tax, however, may curtail reinvestment in the company to such an extent that prices some time in the future, because of restricted supply, may be higher than they otherwise would have been. Thus the tax perhaps may be partially shifted eventually.

The gasoline tax is probably the most successful selected sales tax yet to be devised. It is sometimes a question, however, who actually pays this tax. The sign on the gasoline pump—"6 cents gas tax"—is not in itself an indication that the buyer of gasoline actually pays 6 cents more per gallon than he would pay in the absence of the tax. The supply of gasoline in storage may be very large. Additional storage capacity may be rather expensive, and an increase in price may curtail demand. If a commodity is being produced under the condition of decreasing cost, a reduction in the amount produced will raise unit costs of production. It is possible, therefore, that the seller may pay a part or all of a sales tax in order to maintain output near the least-cost combination.

Whether he will do so in any given instance will depend upon cost and supply conditions and the degree of elasticity of demand for the commodity in question.

The shifting of taxes, as just noted, is a price problem. This is clearly seen when the incidence of a land tax is compared with that of a house tax. A tax on land value will not permit the owner to shift the tax to the tenant in the form of a higher rental charge, because there has been no change in the supply and demand for land. The value of the products produced on the land will remain the same. Since the owner's net return has been reduced by the amount of the tax, however, the land will fall in value.

The house tax has a different effect. Whereas the supply of land is fixed, at least within limits, the supply of houses can change from time to time. Since the house tax will be an added cost of supplying houses, fewer houses will be built. A falling off in the rate of new construction will eventually enable landlords to pass on the tax in the form of higher rents, as long as population continues to increase.

Taxation and Investment Values.—The prices of bonds, stocks, land, and other investments depend largely upon the present value of their anticipated incomes. Consider a plot of land having a yearly income of \$500. If the interest rate is 5 percent, the value of the land, disregarding the speculative element, will be \$10,000. This valuation will be altered, however, if the land pays a 1 percent tax, or \$100 a year. The *net* income is now reduced to \$400 and the valuation to \$8,000. Therefore the imposition of taxes lowers the net income and reduces the price of the property; the reduction of taxes raises the net income and increases the property value. The analysis applies also to bond and stock prices, if the securities are subject to taxation. Thus two bonds having identical security, par values, interest rates, and maturity dates will bear different market prices if one is subject to taxation and the other is tax-exempt, the tax-free bond commanding the higher market price.

When an ad valorem tax is imposed on property appraised in a free market, the market supposedly corrects the sale value of the property so that the income left unappropriated will be equal to the current rate of interest on that value. The formula for the discovery of the new value may be expressed as follows:

$$V = \frac{Y \left(1 - \frac{R}{R - i} \right)}{i} \quad (24)$$

where V = desired property value.

Y = gross yield of the property.

R = ad valorem tax rate.

i = current interest rate.

The Height of Taxes.—There are few candidates for public office who do not solicit political support by promises of tax reduction. Neither the politicians nor the voters, as a rule, distinguish between niggardliness and wise spending, between parsimony and genuine thrift. Legislators might, possibly, reduce taxes if they wished to do so. Schools could be closed, policemen could be released, health could be neglected, highways need not be built, and so on. If it is not advisable thus to curtail government functions, few valid arguments may be made against higher taxes and more government expenditures. There is but one answer to the query: How high should taxes be? It is the one the competent engineer always gives. Taxes in a country controlled by majority rule should be high enough to enable the government to do those things that the majority of the people want done, if the government can do them more efficiently than anyone else.

Efficiency must be taken in its broadest sense. In the building and operation of highways for example, it is not merely a question of production and maintenance costs but also of convenience, uniformity, and progressive development. The problem to be solved is this: Can highways be better administered through private or through public construction and maintenance? The desired services, whichever solution is taken, however, still must be paid for either by means of prices or by means of taxes. From this fact there can be no escape.

Problems

166. "The inheritance tax is the most logical of all taxes. A man cannot take his wealth with him to the grave, and his children should start in life on the same basis as those of the poor man." Do you agree? Why, or why not?

167. In 1930 an automobile sold for \$1,000 f.o.b. Detroit. The government imposed a sales tax of 5 percent of the f.o.b. price on all automobiles. The price of the car thereupon became \$1,050. One month later the price

was \$1,000; two months later the price was \$950. Who paid the tax at each of these prices? Why?

168. "If a nation is burdened with a heavy war debt, the easiest way to meet it is to levy a capital tax, say 10 percent of each person's wealth, because in this way the debt can be paid at once and all possible future interest charges will be saved." Discuss.

169. "Profits are an evidence of efficiency. Profits should not be taxed but should be used in business expansion so that efficiency may be still further increased." Is this desirable? Why?

170. What would be the probable effect on the price of radio tubes if:

a. A tax of 10 per cent of the selling price were levied on every tube sold? Explain.

b. A tax of 5 cents were levied on each tube sold? Explain.

c. A tax of 50 percent of all profits in excess of 8 percent on invested capital were levied on all companies manufacturing tubes? Explain.

d. The income tax that the owners of the radio-tube factories have to pay were reduced by one-half? Explain.

171. Inflation is sometimes referred to as a disguised form of taxation. Who is "taxed" by inflation?

References

BUEHLER, ALFRED G.: "General Sales Taxation," The Business Bourse, New York, 1932.

———: "Public Finance," McGraw-Hill Book Company, Inc., 1936.

COMMONS, JOHN R.: *The Police Power of Taxation*, in "Institutional Economics," The Macmillan Company, 1934.

DALTON, HUGH: "Principles of Public Finance," George Routledge and Sons, Ltd., 1936.

HAIG, R. M., and C. SHARP: "The Sales Tax in the American States," Columbia University Press, 1934.

LUTZ, HARLEY L.: "Public Finance," rev. ed., D. Appleton-Century Company, Inc., 1936.

National Industrial Conference Board: "Cost of Government in the United States, 1933-1935," 1936.

Prentice-Hall Tax Service (a continuous loose-leaf service), Prentice-Hall Publishing Co., Inc.

SELIGMAN, EDWIN R. A.: "Essays in Taxation," rev. ed., The Macmillan Company, 1931.

The Tax Research Foundation: "Tax Systems of the World," Commerce Clearing House, Inc., 1938.

Twentieth Century Fund, Inc.: "Facing the Tax Problem," 1937.

CHAPTER XXVI

PUBLIC CONTROL OF BUSINESS

Public control of business is one vitally significant field in which government activity has been extended rapidly in recent years. Further development of this aspect of government service is highly probable since the public is coming to realize its need for greater protection against various kinds of unfair practices, such as discrimination between purchasers, adulteration of products, and the charging of exorbitant prices. Indeed, the mere fact that monopolistic tendencies are present makes it imperative that such practices as those just mentioned be subjected to control for the benefit of the public as a whole. This control, at present one of the most important fields of government activity, may be secured by (1) "anti-trust" legislation, (2) regulation of "public interest" enterprises, or (3) government participation in industry.

I. ENFORCEMENT OF COMPETITION

Purpose of Anti-trust Legislation.—The effectiveness of the competitive system disappears, from the consumers' viewpoint, wherever there are no active rival business units strenuously competing against each other for the trade of a particular market. Therefore a series of laws has been developed for application to general business that, in the words of Herbert Hoover, aims to "insist upon effective competition." This body of anti-trust laws attempts to attain that end by preventing one business unit from dominating a market through a monopoly achieved as a result of driving out trade rivals, by preventing collusion on the part of supposedly rival concerns, and by forbidding certain other practices. The elaborate anti-trust laws that have been passed in both federal and state jurisdictions set up standards for conducting the competitive struggle partly comparable to the Marquis of Queensberry rules in boxing. The underlying theory here, therefore, is that competition can be depended upon to

organize most industries to the public advantage as long as monopolistic tendencies are eradicated.

Leading Anti-trust Laws.—A number of acts of Congress have been aimed at the preservation of competitive forces in business activity. The *Sherman Anti-trust Law* opened the fight against restraint of trade in 1890 with such a sweeping condemnation of every form of restrictive practice that business never could have developed in its modern form had not judicial interpretation or lax enforcement softened its terms. The act declared illegal every contract, combination in the form of trust or otherwise, or conspiracy in restraint of trade or commerce between the several states or with foreign nations. Penalties were provided for violations of the act, so that the refusal of the common-law courts to enforce such agreements was implemented by the fines and prison sentences provided in the statute.

Two decades later it became evident that statutory action alone was inadequate to meet the problems which appeared in the attempt to control monopoly. Thus the *Federal Trade Commission Act*, passed in 1914, had a dual purpose. First, it established a body of experts whose principal duty was to safeguard competition in industry. They were given very broad powers to investigate the conduct of any business in which it appeared that competition was weak. Second, the commission also was directed to prevent the use of unfair methods of competition. If such practices were found to exist, the commission was required to issue a "cease and desist" order against the guilty parties. This order, however, could be enforced only through the federal courts. Enforcement has proven to be a tedious and difficult matter, and the commission's best work has been done in the fields of investigation and of extra-judicial conferences designed to raise the level of competition.

Since the phraseology of the Sherman act was not sufficiently clear, Congress attempted a clarification of terms in the *Clayton Act*, which also was passed in 1914. Four practices specifically were declared to be illegal, namely, (1) price discrimination between customers, (2) the use of "tying agreements" to compel customers to buy specified articles, (3) the reduction of competition through acquisition of control over competing firms, and (4) the use of interlocking directorships in competitive concerns of more than a specified size. The wording of this act, nevertheless,

failed to eliminate uncertainty as to the legality of many business activities. In addition, the act provided immunity for labor unions and cooperative associations from anti-trust-law restrictions.

In 1918 the *Webb-Pomerene Act* restored the privilege of monopolization to firms engaged solely in export trade to meet the competition of German cartels and export monopolies in other nations. Finally, the *Packers and Stockyards Act* in 1921 placed both these industries under the jurisdiction of the Secretary of Agriculture. Over the packers it granted merely a negative control to enforce competition, similar to but more stringent than that exercised by the Federal Trade Commission over industry as a whole. This control was modified somewhat by the Packers' Consent Decree issued in 1930. The control over the stockyards was positive and direct.

Enforcement.—Enforcement of the federal anti-trust laws depends upon the activities of many agencies. Among these are two executive departments of the federal government, the Department of Justice and the Department of Agriculture; three independent federal commissions, the Federal Trade Commission, the Interstate Commerce Commission, and the Federal Reserve Board of Governors; private individuals whose businesses have been adversely affected by violations, on the part of others, of the anti-trust laws; and the federal courts. Of these the most important are the Department of Justice and the Federal Trade Commission, either of which brings cases before federal courts from time to time for enforcement purposes.

This elaborate machinery to promote competition does not always work with smooth, cooperative efficiency. A study of the situation shows that the various agencies have not been able to work out their several jurisdictions in such a way as to prevent duplication and conflict of effort. This duplication is particularly true of the two leading agencies just mentioned. A more important difficulty rests in the fact that as often as not the courts have disagreed with the several administrative agencies in their interpretation of what constitutes violation of the laws.

Judicial Attitude toward Monopoly.—Two major difficulties are encountered as soon as an attempt is made to apply the anti-trust laws to business situations. In the matter of terminology, these laws are far too vague to serve as a clear-cut basis for

action. Monopolies in restraint of trade are forbidden; but precisely how large a concern must be, or just what it must do, in order to be considered as such a monopoly is not clear.

A more fundamental limitation is the lack of an objective standard for measuring the minimum efficiency that could be expected of business units under active competition, as D. M. Keezer and S. May point out in their interesting book "*The Public Control of Business*."¹ No one has yet been able to tell, by an examination of the products, prices, profits, or plant procedure of any competitive enterprise, whether or not it is performing satisfactorily. Thus government agencies have confined themselves to a consideration of the *form* of competition, regardless of the quality of satisfaction and service rendered to consumers by a given enterprise.

As a result of this confused situation, the courts are prone to decide each case upon its own merits, but a thread of continuity may be found running through many of the cases. Thus the United States Supreme Court has clearly stated that great size, in itself, involves no violation of the law. The United States Steel Corporation in 1920 controlled 50 percent of the steel business of the nation, and the United Shoe Machinery Company in 1918 controlled 90 percent of the shoe machinery, yet neither was considered, in decisions then handed down, to be in restraint of trade. The larger organizations, however, may expect more severe penalties in the event that they suffer conviction for the use of unfair practices. Thus in 1911 the Standard Oil Company and the American Tobacco Company were held by the Supreme Court to be combinations in restraint of trade, as a result of which their dissolution into smaller units was ordered by the court.

Since mere size is not the significant item, court decisions have not only established the legality of large consolidations but also actually have encouraged them, though they may not have intended to do so. Numerous decisions in which competing firms, however small, have been restrained from acting in concert to accomplish ends that are attained with perfect legality by large consolidations have given a marked advantage to "big business."

¹ For a more complete treatment of this question the reader is referred to D. M. Keezer and S. May, "*The Public Control of Business*," Harper & Brothers, 1930.

The court interpretations thus have furnished a strong incentive for consolidation.

From the time of the Trans-Missouri Freight Association case in 1897 until the Standard Oil Company decision in 1911, referred to above, the Supreme Court attitude suggested that any restraint of trade, reasonable or not, was condemned by the Sherman act. In the latter case, the "rule of reason" was announced in the decision handed down by Chief Justice White. The implication was that, since some restraints of trade were *reasonable* and thus not illegal, a new era in law interpretation had appeared wherein the strict letter of the law would yield somewhat to dictates of economic reason. The existence of the rule of reason may be seriously questioned, however, for it has not appeared with any regularity in succeeding cases.

Limitations upon the Use of Anti-trust Laws.—Since corporations may exert a very considerable degree of influence over prices, production, and general business procedure without resorting to specifically illegal practices, legislation in regard to such conduct is not sufficient to protect competitors or consumers. Charges of monopoly or restraint of trade, on the other hand, are not readily substantiated unless they are based upon a careful and intensive study of the industry. These studies depend upon access to the private records of many corporations, but thus far such access has not often been obtained without specific claim of an anti-trust-law violation. This claim, however, must be made "sight unseen" in order to obtain the right to examine the records that may or may not substantiate it. The problem thus provides a serious limitation upon the effective application of the federal anti-trust laws to modern business.

Anti-trust Laws under the New Deal.—The National Industrial Recovery Act (see Chap. XVI), among other purposes, was to remove obstructions to commerce, to promote cooperative action among trade groups, to eliminate unfair competitive practices, and to avoid undue restriction of production except as temporarily required. The government sought to promote the supervised self-regulation of industry through the adoption of codes of fair competition. The codes were drawn up largely by industry and were administered in most cases by trade associations. The code agreements were endowed with exemption from the operation of the anti-trust laws, but monopolistic practices

still were prohibited. The codes in general resulted in a marked uniformity of prices and in higher prices, so that at least some elements of monopoly were present nevertheless. Since the code authorities often were controlled by the larger industries in the trade, some attempts undoubtedly were made to deprive small producers of their markets. The exact status of the codes under the anti-trust laws had not been clarified, however, when the entire system was demolished as a result of the Schechter decision of the Supreme Court in May, 1935. Thus this attempt at industrial self-government was cut short, but not before evidence indicated that industry was not slow to utilize any relaxation in the control exercised by the anti-trust laws.

II. REGULATION OF PUBLIC UTILITY MONOPOLIES

"Public Interest" Enterprises.—The list of industries that have been declared, either by federal or by one or more state jurisdictions, to be "affected with a public interest" is an extensive one. It now includes

. . . steam railways, urban and interurban electric railways, carriers by water, wharf and dock companies, terminal companies, express companies, bus and taxicab companies, telephone, telegraph, and wireless companies, insurance companies, messenger services, market ticker services, boards of trade, gas companies, electric light and power companies, booming and rafting companies, stockyards, commission merchants, creameries, hotels, toll bridges, ferries, tunneling companies, grain elevators, grist mills, ice companies, cotton gins, and laundries. Some of these, such as railroads, water, gas, electric, telephone and telegraph companies, are classified as "affected with the public interest" in almost every jurisdiction in which they operate. . . .¹

while others are subject to this classification in only one or two states.

The wide variety of businesses included in this category indicates that it is difficult to draw up a simple generalization of the economic characteristics of industries subject to public interest control. Industries affected with a public interest, it may be noted, are those that have been declared so by a legislature, without subsequent contradiction by the courts. For many years the Supreme Court consistently accepted the judgment of

¹ *Ibid.*, p. 7.

legislative bodies in regard to the extension of this classification and apparently had no difficulty in finding reasons to support such a course. Thus Chief Justice Taft said:

. . . the circumstances which clothe a particular kind of business with a public interest . . . must be such as to create a peculiarly close relation between the public and those engaged in it and raise the implication of an affirmative obligation on their part to be reasonable in dealing with the public.¹

More recently, however, the court has sharply restricted attempts at the further extension of the field of public interest. Thus it held, in 1927, that theaters are not affected with a public interest and that the prices which ticket brokers charge for resale of seats are therefore not subject to public regulation; in 1928, that state regulation of the fees charged by employment agencies is unconstitutional because such enterprises are not affected with a public interest; and, in 1929, that state regulation of the prices charged for gasoline was unconstitutional for the same reason.

After it has been established that an enterprise is affected with a public interest, the next question relates to the form and degree of government regulation that may be imposed upon it. Since most public utilities tend to be monopolies, they are required (1) to serve every person who applies, and so may not refuse to serve, (2) to serve all persons equally, and so may not discriminate between customers receiving the same service, and (3) to serve at reasonable charges, and so may not charge monopoly rates. The test of reasonable charges, and the problems that grow out of rate regulation, were discussed in Chap. XVI in connection with the valuation of utility property. A brief examination of the regulation of railroads and of electrical utilities will complete the treatment of this topic.

History of Railroad Regulation.—In the United States the first action of the various legislatures with respect to railroads was to issue charters. A charter is a grant of power by the sovereign—in this case, the state—that enables a corporation to exist for certain described purposes and to do certain things. This grant of power from the state affords the community a convenient

¹ 262 U. S. 536.

opportunity to insist that the corporation accept certain principles of conduct as a condition of operating at all. Some early charters, for example, required publicity of rates, fixed maximum scales of charges, called for annual reports, and forbade discrimination. Regulation through charter provisions soon proved unsatisfactory because of conflicting provisions and because a charter is a contract which ordinarily cannot be changed, without the consent of both parties concerned, to meet new conditions.

Granger Legislation.—The most important of the early efforts to establish a system of railroad regulation was made in the early seventies as one result of the Granger movement. The Granges were middle-western fraternal organizations, seeking to improve the economic condition of the farmers. One outcome of such activities was the passage of state laws aimed at the correction of certain railroad practices that were considered unfair. Thus state legislatures established schedules of maximum rates themselves or set up commissions for this purpose; they attempted to prevent discrimination and to preserve competition by forbidding consolidation; and they prohibited the granting of passes to public officials. Railroad officials, on the other hand, maintained that the roads were private property, not bound by the law of common carriers, not public highways, and not subject to regulation because their charters were contracts with the states and because neither states nor Congress had the constitutional power so to regulate.

Legality.—The leading case bearing upon the constitutionality of the Granger laws was that of *Munn vs. Illinois*,¹ though state regulation of rates charged by grain warehouses was the actual point here at issue. The United States Supreme Court upheld the constitutionality of this attempt at regulation because, according to the court, the business was affected with a public interest. Thus a precedent was established for the legality of other regulatory laws. This decision gave to state legislatures the right to establish maximum rates, but 14 years later in the *Minnesota rate case*² this position was modified by the declaration that the courts were to have the final word in the establishment of the maximum rates that might be charged. This "judicial review" became a very serious obstacle to adequate regulation

¹ 94 U. S. 113, 1876.

² 134 U. S. 418, 1890.

throughout the country, since the finding of a commission in a rate case was no longer final.

The Interstate Commerce Act of 1887.—The federal Interstate Commerce Act of 1887 was designed primarily to supplement existing state laws covering railroad regulation, because the Supreme Court in the *Wabash* case of 1886 said that interstate commerce—about 75 percent of the whole—was not subject to state regulation. For this purpose the *Interstate Commerce Commission* was established with powers to inquire into the management of common carriers' business, to require a uniform system of accounts and the rendering of annual reports, and to hear complaints or make investigations relating to violations of the act in the nature of unreasonable or discriminatory rates or practices. It was not until the amendment of 1906, known as the Hepburn Act, however, that the commission was given the explicit power to establish maximum rates.

The Transportation Act of 1920.—The powers of the Interstate Commerce Commission were increased from time to time during the period from 1887 to 1917. Federal operation of the railroads, undertaken as a war measure, was followed by private operation subject to a high degree of regulation as provided for in the Transportation Act of 1920, which returned the roads to their owners. At the same time new powers were conferred on the Interstate Commerce Commission. In addition to setting a maximum rate, the commission was given authority to fix minimum rates. Its approval must be secured by a railroad before new additions may be built, old roads dismantled, or established services discontinued. Orders regarding operating practices may be issued by the commission, and it has a voice in the authorization of security issues and other financial affairs. As a result of these and other provisions, the Interstate Commerce Commission . . . is now the most powerful of the regulative boards associated with the federal government at Washington as well as the most voluminous contributor, through its decisions, to the expanding body of our administrative law.¹

Valuation and Consolidation.—Two other provisions of the Transportation Act remain to be considered. In order to estab-

¹ DAGGETT, S., "Principles of Inland Transportation," Harper & Brothers, 1928, p. 561.

lish the rates that may be charged by the railroads, the commission was required (in 1913) to make a tentative valuation of the railroad properties of the United States upon which a "fair return" was to be earned. The fair return is now established at $5\frac{3}{4}$ percent, and the valuation was set at \$18,900,000,000 until overthrown by the O'Fallon decision of the United States Supreme Court handed down in 1929. The commission estimated the original cost of railroad property on June 1, 1933, to be \$26,232,000,000.

The disparity in earning power between the strong and weak railroads in the United States raises a fundamental problem of regulation that was well stated by Senator Cummins when he said:

We are agreed that we cannot raise the rates upon the weaker properties so that they will be self-sustaining, because that would give to the stronger properties, which move 70 percent of the business of the United States, an income so excessive that it would not be tolerated for a single month. . . . We cannot give to the stronger properties the rates which would return for them no more than a fair interest upon the value of their property . . . because that means death to the weaker properties. . . . You may inquire as you will . . . but you will finally reach the conclusion that it can only be done by consolidation.¹

Accordingly, the Transportation Act required the commission to prepare plans for a voluntary consolidation of the more than 1,900 railroad companies into a small number of great all-inclusive systems. Thus it was hoped the strong-weak road problem would be solved at the same time that other questions of regulation and valuation would be simplified materially. The commission published its tentative plan for consolidation in 1921. After years of public hearings and discussions on this subject, the revised plan was set forth in 1933. It calls for twenty consolidated systems, two of which are holdings of Canadian railroads, leaving eighteen systems for continental United States.

Present Status of Consolidation.—The railroads have not consolidated as the framers of the act anticipated. Several reasons for this failure to take action may be noted. Strong railroads with a good earning capacity have not been anxious to burden

¹ *Congressional Record*, Vol. 59, Dec. 4, 1919, p. 131.

themselves with the weaker properties. The officials of the smaller companies wish to retain positions which would be abolished in the event of consolidation. Since the consolidations are not permitted to overcapitalize their properties, the chief financial motive for combination is prohibited so that the large banking houses are not interested in these changes. Finally, the leading operating economy of consolidation, namely, a reduction in labor costs, would be obtained only if employees were discharged. This addition to the ranks of the unemployed has been undesirable during the depression of the 1930's. For these and other reasons, voluntary consolidation has not been accomplished. The alternative of compulsory consolidation appears to be unconstitutional, so that the ultimate solution to this vexing problem is not evident as yet.

However, public opinion has evidenced a change of front in regard to railroad operation. At first, competition was to be forced upon the roads at any cost; at present, the tendency as evidenced by legislative action is toward the antithetical viewpoint of closely regulated monopolization. This change in public opinion is highly significant, for it is prophetic of the probable future status of other public interest industries, as well as of the possibility of a further change to government ownership and operation of the railroads.

Regulation of Other Public Interest Industries.—Interurban electric lines, street railways, telephone and telegraph companies, electric light and power companies, gas companies, water companies, insurance and banking companies, and boards of trade are also subject to a considerable degree of regulation, most of which emanates, however, from the state rather than the federal governments. These industries are generally placed under the control of state commissions, of which some exercise very wide powers while others have but little significance. The latter case, for example, often is true of electric light and power companies.

Rates on Domestic Electric Service.—The electrical utility industry is composed of about 3,500 producing companies capitalized at \$12,600,000,000 that generate 30 billion kilowatt-hours a year. Over nine-tenths of this current, however, is generated by 194 private and 21 municipally owned plants. Two-fifths of the current is used by the 20 million residential consumers of the United States, who contribute 70 percent of the

total revenue obtained by the electric power industry. The average cost for such current in the United States is 5.8 cents per kilowatt-hour.

Many consumers obtain current at rates very much lower than the national average. Thus residents of Tupelo, Miss., the first municipal customer of the Tennessee Valley Authority, enjoy an average domestic rate of 1.8 cents, while the clients of the Seattle municipal plant pay 2.8 cents. Indeed, municipal plants generally have lower rates than privately owned plants according to the Preliminary Rate Survey of the Federal Power Commission published in 1935. This survey revealed the significant fact that most domestic consumers use very small quantities of current. Of the 20 million residential customers in the United States, 25 percent consume less than 15 kilowatt-hours per month; an additional 25 percent take only 25 kilowatt-hours; and 75 percent consume less than 40 kilowatt-hours. Since 40 kilowatt-hours is sufficient only for lighting and a few small appliances, electric refrigeration (100 kilowatt-hours per month) and electric cooking (250 kilowatt-hours) are confined to the 25 percent of consumers who take more than 40 kilowatt-hours. Thus the domestic market for electric energy may be increased enormously if electric rates and electric appliance costs are reduced. Tupelo, Miss., furnishes an excellent example. Before TVA power was available, the average domestic rate was about 7 cents; the reduction to 1.8 cents resulted in an increase in consumption of 270 percent!

Causes of High Domestic Rates.—Three causes for the high domestic rates charged by many private electric utilities may be mentioned. In the first place, the cost of serving residential customers is higher than that for commercial or industrial users of power. The distribution costs, the equipment requirements for "readiness to serve" at peak loads, and the cost of meters and monthly bills, all in terms of the small monthly consumption of most residential customers, require rates higher than those charged to wholesale users of power. In spite of these factors, however, municipal rates to domestic customers indicate that the high charges for residential current are due in part to other causes.

Ineffectiveness of Regulation.—A second cause of high domestic rates is to be found in the ineffectiveness of electric utility

regulation. Since most of the electric utility business is intra-state in character, regulation is in the hands of state commissions. The commissioners commonly receive very low salaries and are greatly overworked. Lack of funds often prohibits the use of an adequate staff of accountants, engineers, and lawyers. As a result the commissioners cannot perform adequately the tasks which face them. In some states a large majority of the electric light and power companies' books have never been examined adequately.

Furthermore, court decisions have so restricted the commissioners in the supervision of the amounts charged to operating expenses by the utilities that effective control of this important problem has been seriously impaired. The Public Service Commission of Missouri, for example, regarded as unreasonably high the payment of $4\frac{1}{2}$ percent of the gross revenues of the Southwestern Bell Telephone Company to the American Telephone and Telegraph Company as rents for apparatus, licenses, and services under the customary form of contract between the latter company and its subsidiaries. The commission disallowed about 55 percent of the rentals paid under this agreement on the ground that they were not proper operating expenses to be deducted from gross revenue in the calculation of net earnings. The Supreme Court overruled the commission, and said that this practice did not represent an abuse of discretion by the corporate officers. The discretion of the company management in this case is pointless, since the subsidiary was controlled completely by the parent organization. The significance of the rental transaction becomes evident when it is noted that the Southwestern Bell Telephone Company paid 8 percent on the stock owned by the parent company, whose total income was thus about $12\frac{1}{2}$ percent when the rentals were included. Because of the rental device, this large income was secured without the attendant publicity of an unduly high dividend rate on the securities of the subsidiary. This example from the telephone field is comparable to the problems that face commissions in the regulation of electric utilities.

Commission control also is weakened or destroyed because of judicial interference in the valuation methods employed to determine the fairness of the rates charged, as discussed at some length in Chap. XVI, and because legislation frequently is inade-

quate to give the commissions the authority necessary to perform their duties efficiently.

The Holding Company Problem.—The third cause of high domestic rates is to be found in the widespread control of operating companies by holding companies in the electric utility field. Only thirteen holding company groups controlled 75 percent of the privately owned electric utility industry in 1935, when the Holding Company Act became law, while 40 percent of the industry was controlled by three groups, namely, the United Corporation, the Electric Bond and Share Company, and the Insull group. One-fifth of the power generated in the United States is interstate power which is not subject to regulation by any state; 99 percent of this interstate business was controlled by twenty systems. A similar situation existed among the utilities which supply natural gas, for eleven systems controlled 80 percent of the pipe lines.

Arguments For and Against the Holding Company.—Five arguments commonly are advanced in favor of the holding company type of organization in the electric utility field. The holding company is said to improve the capacity and load factors of an interconnected system because the peak loads on various parts of the system do not occur at the same time. Thus a smaller generating capacity, and so a smaller capital charge, will be necessary to carry a given load due to the interchange of power between the various parts of the system. The service also is said to be improved because there is less danger of interruption due to a breakdown in a given generating station or transmission line.

In the third place, the management is asserted to be superior since the large organization can afford to provide a corps of highly trained technicians whose services are available to all the parts of the holding company system. Furthermore, it is claimed that savings may be obtained in the purchase of equipment and supplies because of the wholesale nature of these transactions and, finally, the holding company is said to obtain cheaper credit and lower interest rates because it can offer greater safety to the investor and can attract capital in larger amounts.

An examination of the arguments advanced in favor of the holding company indicates that they are advantages of large-scale interconnected systems, but that they are not peculiar to the holding company form of business organization. Certain

disadvantages, however, seem to be typical of this particular form of organization. The dangers of overcapitalization, of pyramided control, and of pyramided earnings were discussed in Chap. V and need not be repeated here. As an example, the Commonwealth Edison Company of Chicago, an Insull property, owned the Peabody Coal Company and the C. and I. M. Railway. As a result the coal used by the Commonwealth Edison Company was said to cost \$1.50 per ton more than was necessary; the excess profits of the coal and railways companies permitted certain stockholders to obtain excessive income at the expense of the electric customers of Chicago. As a result of the holding company disadvantages—chiefly in the field of “high finance”—and because all the advantages of the holding company may be obtained by a large operating company, federal legislation has been passed in the attempt to restrict holding company activities.

The Public Utility Holding Company Act of 1935.—The Holding Company Act contains three important clauses. First, all holding companies in the electric power and natural gas fields were required to register with the Securities and Exchange Commission by December 1, 1935. Registration required the companies to obey the orders of the commission; failure to register carried the penalty of exclusion from the use of the mails or of any agency of interstate commerce for sales, contracts, and security rights. The penalty supposedly would prevent unregistered companies from continuing in business. Second, the commission, as a result of examinations of the various corporate structures, after January 1, 1938, had power to order simplifications of corporate structure in order to limit the activities of each holding company to a “single, integrated public utility system” serving a closely knit geographical area. Third, interstate transmission and sale of electric power or natural gas were brought under the control of the Federal Power Commission.

When the act first was introduced in Congress it contained the famous “death sentence,” which would have abolished all holding companies in the electric and gas fields by 1940 unless the commission granted specific exemptions. As a result of far-flung propaganda and lobbying activities on the part of many utilities, the “death sentence” was modified so as to permit the existence of at least one holding company in each integrated system. The attack on the act continued after its passage, but

in 1938 the Supreme Court upheld as constitutional the section of the act relating to registration.

Regulation of public interest enterprises of necessity must continue to bristle with problems which evade solution. The backwardness of state legislatures and commissions and the conservative viewpoint of the courts prevent adequate protection of the public interest. The chief difficulty with regulation, however, results from the fact that the interests of the parties involved are diametrically opposed. The stockholders in public utilities desire maximum profits with low wages, a small investment, and the minimum of service. The employees desire to maximize wages at the expense of the other items, while the consuming public wants good service at the lowest possible rates. As long as these three classes in the main are separate groups of persons, their interests are necessarily in opposition. Each group will do all in its power to enhance its own interest, and constant strife and court litigation will result. In view of these facts many persons maintain that the only solution for the public utility problem lies in government ownership and operation of the various enterprises.

III. GOVERNMENT PARTICIPATION IN INDUSTRY

Direct government participation in industry is one of the alternatives available to communities in their endeavor to control economic activity. This participation may take three forms: (1) control without operation, (2) competitive operation, and (3) monopolistic operation.

Control without Operation.—It is perfectly feasible for a government to control business activity if it owns a majority of the voting stock in most of the firms operating in the fields in question. The exercise of voting rights is then all that is necessary to insure that desired policies as to service and rates will be carried out. The present financial structure of industry renders such control a relatively simple matter in some fields.

The electric light and power industry again offers an excellent example. About 75 percent of the production of electrical power in continental United States is in the hands of thirteen holding companies and their affiliates. Suppose the federal government obtained control of a majority of the voting stock of these holding companies through open-market purchase or through condemna-

tion proceedings. If a non-political commission were created to exercise the voting power of this stock, practical control of electrical industry rates and practices throughout the United States would rest in the hands of the commission.¹ Furthermore, it is unlikely that such control would be subject to judicial interference of any kind.

Why have governments turned to the much more clumsy method of state ownership and operation, next to be described? It is difficult to find a satisfactory answer. Business executives repeatedly cry, "Keep the government out of business." This attitude is opposed to the government ownership that is in competition with private ownership or to government regulation of one sort or another. If the government, on the other hand, controls industry through a majority stock interest, such control logically is no more open to these attacks than is control by the financial interests now holding the majority voting power in the same stock. It should be evident that control through stock ownership generally would be cheaper as well as more effective than regulation by means of any of the other methods available. An important possible exception is that of the railroads, where both preferred and common stocks carry voting power. The expenditure for a voting majority would thus be much greater here, especially since holding companies are not yet widely used in this field. They are in process of development, however, and may soon present a possible solution to this particular problem.

Public Ownership with Private Operation.—Another method by which the government may control properties without operating them is that in which the utility is constructed by the government and then is leased to a private corporation which operates the property. Thus one of the New York City subways was constructed by the city when private capital was unwilling to undertake the task. Upon completion of the construction work, the subway was leased to a corporation which operates it at rates, and under service conditions, specified in the lease. Thus litigation in the courts over valuation and kindred problems is evaded because the rights of the public are protected by the leasehold provisions.

¹ It is interesting to note that this plan of control was advocated in 1924 by K. C. Gillette, one of America's leading businessmen, in a book entitled, "The People's Corporation" (Boni & Liveright).

Competitive Operation.—The list of enterprises in which direct government participation on a competitive basis has been used as an instrument of regulation includes a number of forms of insurance, banks, grain elevators and mills, housing projects, gas and electric companies, fuel yards, ice plants, abattoirs, milk supply stations, and laundries. Such activities have been undertaken, until recently, by municipalities and other local agencies rather than by the state or federal governments. The following illustration presents an example of the effect of government competition upon electric rates.

The Lincoln Public Service Company (of Lincoln, Neb.), privately operated, charges a top rate of 5 cents per kilowatt-hour where most surrounding cities charge 10, 12, and 15 cents. Moreover, after you use 10 kilowatt-hours you get it for 4 cents, all over 40 kilowatt-hours for 3½ cents, and all over 500 at 3 cents.

That is to say, a Lincoln housewife can buy as much current for \$2 as most Nebraska women pay \$4 to \$6 for. Likewise, Lincoln merchants and power users pay less than half of what they would in other places.

The explanation of Lincoln's low rates is Hon. William Schroeder, member of the city commission, for twenty years or more superintendent of the Water Department. . . . Schroeder, already uneasy over private rates . . . asked the council to pass an ordinance giving him the right to sell current. . . .

He set his first rate at 9 cents per kilowatt-hour, against a private rate of 13. After an unsuccessful legal battle against the rate, the private companies dropped to 9 cents. Later Schroeder reduced rates again. The private companies followed suit. City rates have again dropped to their present level, and again private rates have followed. The private companies still do 85 percent of the business, but the people have cheap current.¹

Monopolistic Operation.—In the third form of direct participation, federal and local governments have engaged in enterprises to provide goods or services that are judged to be of great importance to the general citizenry but are of such a nature either that their production does not promise sufficient profit to attract private enterprise or that the government is unwilling to trust them to private control and so establishes a monopoly for their production. Some representative examples are canal construction,

¹ Scripps-Howard newspapers, August, 1926, quoted by Keezer and May, *op. cit.*, footnote 2, pp. 9-10.

highway building and maintenance, currency issue, postal service, police service, coast guard, geological survey, weather bureau, and a great number of municipally owned and operated sewage system, water, gas, and electric works monopolies.

Public Operation with Private Ownership.—Federal operation of railroads, beginning Dec. 28, 1917, and terminating Mar. 1, 1920, was an *operating control* for war purposes which required no change in the ownership of the properties involved. The total burden to taxpayers in the United States as a result of the 26 months of federal management plus an additional 6 months of earnings guaranties amounted to \$1,123,500,000. This deficit has led to repeated assertions that federal operation was not a success. The wartime experience hardly proves or disproves this contention, however.

Federal control of railroad and other transportation systems was undertaken as a war emergency. . . . The personnel that handled the railroads during the rapidly passing period of government control was entirely made up of experienced railroad men. . . . The selection of all personnel was entirely free from politics. There was an adequate and praiseworthy performance of the public service during the extremely difficult conditions of the war and the equally difficult and constantly changing readjustments after the armistice. . . .

The increased cost of railroad operation during the period of federal control was due to the war and could not have been avoided by any other means of control. If private control had been retained, the increased cost of railroad operation would still have had to be met. The war would have had to be paid for, even in the case of private control of railroads. In that event, if the entire burden could not have been met through a combination of impaired service to the public and of losses to the railroad security holders, this would probably have forced some form of government subsidy so as to place part of the burden on the public treasury. . . . Any fairly balanced study of the situation as a whole must lead to the conclusion that in periods of extraordinary difficulty the government's temporary operation of the railroads accomplished with credit the objects which made resort to it imperative.¹

Judicial Attitude toward Government Participation.—In spite of the fact that the government can regulate and even destroy private enterprise through ventures in direct government par-

¹ HINES, W. D., "War History of American Railroads," Yale University Press, 1928, pp. 238-239.

ticipation in industry, up to the present time the United States Supreme Court has placed no judicial limitations upon the power of a local government to expand its activities in this direction. Rather, the court has declared that the state may engage in . . . almost any private business if the legislature thinks the state's engagement in it will help the general public and is willing to pay the cost of the plant and incur the expense of operation.¹

The Supreme Court, by virtue of a series of decisions of which a few have been summarized in this chapter, has "strained at the gnat and swallowed the camel." It has placed restrictions upon the agencies enforcing the comparatively mild anti-trust and public utility laws in such a way as seriously to limit their effectiveness. These restrictions have been called forth by the courts for the protection of private property. Up to the present time, however, no restrictions have been placed upon the right of communities to engage directly in business enterprises, although such activity carries a much greater potential threat to private business interests than does either of the other two forms of regulation.

Problems

172. Public utilities, such as streetcar, telephone, gas, and water companies, usually operate under a franchise. The companies that make up United Aircraft Corporation do not.

a. Why this distinction?

b. If you owned bonds in a public utility, under what conditions would you wish to eliminate the use of franchises? Why?

c. If you held shares of stock in United Aircraft, under what conditions would you wish the business to be governed by franchise agreements? Why?

173. "Efficiency of production requires that industries consolidate to control output. Protection of consumers requires that there be no restriction on the free play of competition." Are these statements true? Can they be reconciled? Are they being reconciled by the Supreme Court; the Federal Trade Commission?

174. Can the federal government or any state government create any kind of a commission that will be "non-political"? Explain.

175. Mr. *M* manufactures mimeographing equipment. If he requires purchasers of his patented mimeographing machine to sign contracts agreeing to buy all ink, stencils, and paper from *M*, can the contracts be enforced? Is this advisable? Why?

176. In speaking of the problem of governmental control, John T. Flynn in a syndicated news article on May 3, 1938, said: "New abuses arise and

¹262 U. S. 537, 1923.

these must be curbed. The very effort at correction produces new maladjustments and these provoke new experiments. Thus we behold the fantastic spectacle of laissez-faire forging the chains for itself and singing away the songs of individualism while it abolishes individualism."

a. To what extent has the development of engineering led to more governmental control?

b. Can you cite any specific cases in which governmental control has retarded the advance of engineering?

c. What determines how much governmental control people desire?

References

BONBRIGHT, J. C., and G. C. MEANS: "The Holding Company," McGraw-Hill Book Company, Inc., 1932.

CLARK, J. M.: "Social Control of Business," University of Chicago Press, 1928.

FETTER, F. A.: "The Masquerade of Monopoly," Harcourt, Brace & Company, 1931.

KEEZER, D. M., and S. MAY: "The Public Control of Business," Harper & Brothers, 1930.

LYON, L. S., and V. ABRAMSON: "The Economics of Open Price Systems," Brookings Institution, 1936.

MOSHER, W. E., and F. G. CRAWFORD: "Public Utility Regulation," Harper & Brothers, 1933.

MOULTON, HAROLD G., and associates: "The American Transportation Problem," Brookings Institution, 1933.

RUGGLES, C. O.: "Problems in Public Utility Economics and Management," McGraw-Hill Book Company, Inc., 1933.

CHAPTER XXVII

THE ECONOMICS OF COLLECTIVISM

Almost everyone objects to some aspect of the present economic system. Some persons declare there is too much government interference in the conduct of business; they desire a return to rugged individualism. Others assert that the present system would function quite satisfactorily if it were modified slightly in various ways; they want crop controls, railroad consolidation, or a Wagner Labor Act, for instance. These individuals thus believe that an extension of government regulation in one direction or another will serve to rejuvenate capitalism. A third group of persons insists that capitalism is becoming more and more unworkable and that the preservation of civilization necessitates certain changes in our economic order. Some of these opponents of the present system are motivated almost entirely by ethical considerations while others base their position on the factual record of capitalism as they see it. These latter call attention to the inequality of economic opportunity which is a result of the present distribution of wealth and income, the appalling wastes caused by business cycles, the lower standards of living and the social losses incurred by many families owing to the private receipt of profits and the personal use of property, and the unfortunate emphasis placed by the present economic system upon scarcity instead of plenty. The purpose of this chapter is to review the economic system as it operates today and to survey the leading proposals for the reform of the system.

I. THE BASIS AND OPERATION OF CAPITALISM

The Foundations of Capitalism.—The foundations of capitalism are to be found in the institutions of private property and freedom of contract, and in the legal structure and public acceptance which give these institutions life and meaning. Both institutions are essential to capitalism as we know it today; if either one

were greatly modified, production and consumption still might continue, but under conditions so different from the present that the economic system no longer would be recognizable as one of capitalism. It is well to remember in this connection that these institutions are not fixed, permanent, and immutable. Rather, they undergo continuous change from year to year: the freedom of contract of employer with employee no longer is the same as it was in 1932 nor is the right of private property in gold coin today identical with that which existed in the 1920's. Capitalism is not only a changing system but it also is a relatively new system in the world's history. The characteristics of a primitive stage of capitalism can be found in Greek civilization, but some of those associated with the advanced stages of capitalism are not older than the federal government of the United States. Conservatives emphasize this fact when they oppose changes in the system on the ground that capitalism is so new it has not yet had a fair trial and thus should have a further lease on life of several centuries so men can see what it really can accomplish.

Private Property.—The right of private property seems perfectly natural and inevitable to most persons. They see nothing strange in the fact that the owner of property not only may use and dispose of his property as he wishes (with certain legal limitations) but also may exclude others from using it whether he actually uses it himself or not. This right, however, is man-made and may be modified or abolished by men when they choose to do so.

The origin of private property is unknown since it is shrouded in the antiquity of man. One explanation suggested in the effort to illuminate the growth of this institution may be called the *labor theory*: in the absence of an agreement to the contrary, what a man makes with his own hands is his own property. Men somehow feel that it is only "right" and "fair" that the product of a man's efforts should belong to him. Hence ornaments, weapons, and tools undoubtedly represented the earliest forms of private property and preceded the private ownership of land, which first was the property of the family or tribe and only after a long interval became the property of the individual. When it came to explaining private property in undeveloped land and natural resources, however, the labor theory proved to be deficient because these types of property were *acquired* rather

than *produced* by man. The *appropriation theory*, which suggests that private property results from prior occupancy or from forceful acquisition, was thought by many to be a more plausible explanation. These two theories together may serve to explain the origin of the institution of private property, but they do not justify its continuation. For this purpose a third theory is necessary, namely, the *theory of social utility*. According to this theory, private property rights continue to exist and may be justified only on the ground that private property socially has proved to be the best method of utilizing natural resources in the production of wealth. Thus if public property in some field proves to be more useful than private property, this theory would justify the further limitation of the institution of private property in the same way that it would support the continuation of the institution where it would seem to produce the best results.

The right of bequest or inheritance of property, it should be noted, is not an essential part of the right of private property but instead is an important corollary of it. Society might abolish the right of inheritance without destroying the right of private property, although the two rights are very closely related and can be justified only on the same grounds.

Freedom of Contract.—A fundamental aspect of the right of private property is the right to make contracts with other persons for the use or disposal of the property. Freedom of contract not only makes private property effective, but also permits individuals to assume the performance of obligations involving personal services. The interdependence necessitated by the minute division of labor characteristic of our economic system requires the performance of many contracts of all sorts. The lease of plant or equipment, the regular delivery of raw materials at stated prices, the purchase of electrical energy, the hire of workmen, the provision of working capital at a given interest rate by a commercial bank, the protection offered by insurance, the transportation of the finished product, and its sale to consumers are but a few of the daily transactions which involve contractual relationships. Production as we know it today would be impossible without the rights and obligations involved in contracts, although this aspect of capitalism also is relatively new. Not so long ago, for instance, rights and obligations were based upon status—slavery and serfdom—instead of upon contract.

The Place of Government in Capitalism.—The institutions of private property and freedom of contract require the presence of a disinterested, authoritative third party. Some agency must draw up the laws which represent the public will in respect to these institutions and must enforce that will impartially. This agency is government. In the absence of government the “rights” of private property and of freedom of contract would not be rights at all. The strong would coerce the weak; property would be insecure; and the enforcement of contracts would depend upon “might makes right.” The essential place of government in capitalism, therefore, is to guard and to enforce the *rights* which are basic to free enterprise. To the extent that all persons are not equal before the law—as they are not in fact, for economic and other reasons—the cornerstone of capitalism is weakened and ruthless acquisitiveness for personal gain is encouraged.

Collective Action in Capitalism.—One of the significant aspects of the modern industrial world, as has been pointed out repeatedly, is the far-flung cooperation by means of which men produce the goods and services which they desire. This cooperation has grown apace with technological progress, for technological methods by their very nature involve collective action. There are two general kinds of collective action. The first is typified by the collective activities within a given plant, whereby men, machines, and materials are combined in the best factoral proportion. The second type of collective action is social rather than individual in nature; it involves the whole nation—or even the entire world—and not any one plant alone. Collectivism here involves the combined action of all producers to supply consumers with the quantities and qualities of goods they desire at prices low enough to permit full utilization of the nation’s productive facilities. It is here that capitalism makes its unique contribution to the economic problem. This extraordinarily complex task of coordinating the activities of all producers is left by capitalism to the producers themselves, just as if each workman in a plant were allowed to decide for himself what he should do and how he should do it. Let us summarize this automatic regulation of production under capitalism.

The Operation of Capitalism.—The capitalistic system is essentially a market economy. Since its operation is not under the

direction of any central authority, its sole organization consists in the exchanges undertaken by individuals or corporations that are made dependent upon each other by the division of labor. Individuals and companies control the means of production—the labor, capital, and land that are in their private possession—and seek to maximize individual incomes through market exchanges. The direction of production is determined by prices: by the prices of the means of production, which are costs, and by the prices of the products. All these prices are established by the free interplay of the forces of supply and demand. Thus if prices exceed costs a profit is to be obtained and production may be expanded; if not, a loss is to be expected and production tends to be restricted.

The key mechanism in capitalism, therefore, is that of price determination. This process of pricing depends upon the circumstance that, in a system where there is division of labor without central control, all the individuals are forced to exchange commodities and services with one another and at the same time presumably are concerned to get as much as they can for themselves out of the exchanges. Acquisitiveness and competition together lead to the establishment of the highest price at which the total supply will be taken off the market. All prices, however, are connected with one another. The demand for consumption goods is determined in part by income levels, which in their turn are the result of the prices paid for the factors of production, which again are related to the prices of the consumption goods that they produce.

Since the factors of production usually can be employed in many different ways, and since their owners seek the highest price obtainable, the factors tend to be utilized in those channels where they command the highest returns, and the goods produced are those which yield the greatest profits. In the absence of new inventions, the forces of supply and demand tend to bring the economy to a state of equilibrium in which further changes are neutralized because owners' incomes already are maximized. If inventions and discoveries continue to appear, economic readjustments constantly must be made. In either case it is the ability to pay, and not the need, for the goods which governs the direction of activity. There is no assurance that the methods of production which are best technically or socially will be utilized, for they may not be economically best for the individual enter-

prisers. There is no assurance that the most pressing needs of the population will be filled before the less urgent ones, particularly if incomes are distributed unequally. There is no assurance, especially if competition is imperfect, that the thousands of independent producers will happen continuously to turn out the right quantities of the right qualities of commodities desired by consumers nor that the proper amount of funds to purchase these goods will be in consumers' hands at the right time. Economically speaking, capitalism is somewhat akin to "blindman's buff" when all the contestants are blindfolded.

Advantages of Capitalism.—Proponents of capitalism point out several advantages of this system. Most convincing is the fact that the system actually works. In the relatively brief period of its existence capitalism has led to an extraordinary increase in the quantity and diversification of the goods available for mankind. Standards of living are far higher and the pleasures of life are said to be infinitely greater than ever before in the world's history. The dependence of man upon the direct bounties of nature and the amount of physical effort required to maintain life have been reduced materially.

The automatic nature of the system is cited as a second advantage of capitalism. Thus, it is said, the correct quantities of goods of all kinds appear upon the market from day to day, yet no person or group is required to plan the tremendous variety of details involved. Indeed, some supporters of capitalism deny that men have the knowledge or ability to plan or to operate a system on a scale such as ours and assert that automatic operation is highly desirable because it reduces to a minimum the danger of errors from human fallibility in the same way that thermostatic control gives a more even temperature than manual control.

Capitalism is said also to provide a more intangible advantage over other systems, namely, the personal freedom of the individual. In a *laissez faire* economy each man is free, within wide limits, to do as he wishes with his labor and his property. He is not subject to arbitrary or onerous restrictions by planning commissions or dictators. Capitalism therefore is declared to be particularly "American" because it is based upon that freedom of life, liberty, and the pursuit of happiness asserted as a right in the Declaration of Independence. Thus personal freedom,

automatic operation, and the test of time compose the three outstanding arguments in favor of the present economic system.

Weaknesses of Capitalism.—Critics of the present economic system cite a number of weaknesses to which they claim capitalism inevitably is subject. The profit motive itself often is declared to be a fundamental weakness. Production for personal gain instead of for social welfare results first of all in an overemphasis upon ability to pay. The wealthy individual can secure almost any commodity he desires while the mass of the population, who have small incomes, find their choice of goods very narrowly restricted because of the necessity to maintain life. In the second place, the profit motive frequently leads to the curtailment of production instead of to its expansion. If enhanced profits will result from the restriction of supply, businessmen often find ways to curtail the effects of competition in the attempt to secure a monopoly price. In the third place, the profit motive does not lead to the improvement of quality unless buyers are well informed and insist upon obtaining their money's worth. Thus critics assert that no economic system is socially justifiable so long as its motivating force fails to guide activity in the direction of social welfare instead of in that of personal gain.

A second criticism of capitalism is leveled at the inefficiencies inherent in any planless system. Just the right quantity of goods almost never appears on the market at the right time; witness the recurring cycles of prosperity and depression. We do not use our production facilities in the best manner that could be devised; we fail to conserve our natural resources; our marketing system is woefully inefficient; and our utilization of manpower would not be tolerated for a moment by any self-respecting slave owner—such an individual would employ and care for his slaves in ways far superior to those of industry in general. Waste is an outstanding characteristic of capitalism.

A third criticism declares that capitalism overemphasizes property rights at the expense of personal rights. The fundamental rights set forth in the Declaration of Independence have been subordinated to the secondary rights established by the Constitution. Most men desire a considerable degree of security, whereas the capitalistic system makes only a limited effort to meet this need for the great mass of people, who own little or no property. In the absence of social security measures, capitalists

are under no direct obligation to care for their workmen when the daily wage contract has been completed. Property rights seem to take precedence over personal rights. A corollary of this overemphasis upon property is the highly unequal distribution of wealth and income which results from, and is perpetuated by, property rights. The great majority of people under capitalism probably have little chance to rise much above the level of subsistence unless incomes can be redistributed or output can be considerably increased.

Wealth and Income Distribution.—The unequal distribution of wealth and income in our capitalistic system may be indicated briefly by the following facts. The distribution of wealth has been estimated, on the basis of 1928 federal estate taxes, to be so unequal that about 16 percent of the value of estates was centralized in the hands of one-half of 1 percent of the owners, while 15 percent of the value was distributed among 51 percent of the owners.¹ In terms of income, 75 families at the top of the income scale in the United States together are said to receive more income than 1,200,000 families at the bottom of the scale, and 1 percent of the families have as much income as do 40 percent of the families.² About 28 percent of all families continually face starvation and 38 percent constantly fight against poverty, while only about 7 percent of the families can afford luxuries or can accumulate fortunes.

The size of incomes is related closely to their sources. Thus incomes under \$5,000 a year in 1929 came primarily from wage and salary payments (57 percent), and from proprietorship earnings (16 percent). Incomes over 1 million dollars, on the other hand, were obtained chiefly from profits from the sale of property (50 percent), such as stocks, and from dividends (36 percent).³ It is interesting to note, finally, that income tax returns indicate as many women millionaires as men, and show the payment of income taxes by women on almost as much gross income as the amount paid by men.

Personal Attitudes toward Capitalism.—All persons may be classified roughly into one of three groups upon the basis of

¹ "Statistical Abstract of the United States," 1930, p. 21.

² Press release August 19, 1938, on a study of family incomes in depression by the United States Bureau of Labor Statistics.

³ "Statistical Abstract of the United States, 1930," p. 204.

their attitudes toward the capitalistic system. The *conservative* is a "rugged individualist" who emphasizes the advantages of capitalism and belittles its weaknesses. He prefers a *laissez faire* economy, which will not restrict his property rights or his receipt of a large income. He believes in competition as an automatic regulator of economic activity, although he often expects others to be subject to competition while he himself enjoys certain special privileges of a monopolistic nature. Such a conservative may long for the "good old days" when government remained aloof from business, yet he may be an ardent supporter of protective tariffs and may demand all sorts of services from government bureaus in Washington. In spite of these inconsistencies, however, the conservative in general is a supporter of free capitalism and opposes government regulation of business.

The *liberal* takes a "middle of the road" position. He recognizes both the good and the bad aspects of the capitalistic system. While he would not defend the inequities of capitalism, he believes this system is the best one available and feels that it can be modified so as to produce the results that most men desire. The modification is to come largely as a result of government regulation of those aspects of capitalism which function in the least satisfactory manner.

The *radical* occupies a place diametrically opposite to that of the conservative. The radical sees only the weaknesses of capitalism and is so strongly impressed by its inefficiencies and lack of justice that he wishes to abolish this system altogether and to substitute some other system in its place. While radicals agree upon the pressing necessity for change, they show little unanimity of opinion as to the substitution which should be effected. Let us examine in more detail the solutions proposed by liberals and radicals.

Government Regulation of Capitalism.—Capitalism as we find it in the world today is not free, but is subject to regulation by various government agencies. This regulation represents an attempt to overcome some of the more glaring weaknesses of the automatic system. Labor legislation seeks to correct the inequalities in the bargaining positions of employer and employee; public utility regulation is aimed at consumer protection from monopoly rates and practices; "blue-sky" laws and control of the

security and commodity exchanges attempt to abolish the more undesirable practices of unscrupulous profit seekers; and banking regulations try to guard the interests of depositors as well as to obtain social benefits from a banking system organized along individualistic lines.

The underlying philosophy of the New Deal legislation is part and parcel of the liberal's attitude toward regulation as a means of correcting the weaknesses of capitalism. The program of action based upon this philosophy is composed of two parts: The government should oblige each factor in industry to cooperate with the others and with the government in the peaceful settlement of industrial disputes of all kinds without resort to the arbitrary use of economic or physical power, and the government should give positive aid to the various factors in industry to assure social as well as personal benefits from economic activity. By analogy, governments have built highways, have licensed operators of motor vehicles and limited speed and mode of operation by law, have established traffic lights and one-way roads, and in other ways have regulated the rights of individuals to use the highways. Despite all restrictions, however, individual control of when, where, and how to travel is retained. Indeed, the liberal would assert that motor travel could not be so free and convenient as it is unless these regulations were imposed, so that certain limitations of individual freedom result in greater freedom for everyone.

Weakness of Regulation.—Two inherent weaknesses appear whenever a capitalistic economic system is subjected to government regulation. On one hand, the motivating force still is the search for personal profits. Thus there is every incentive to evade or to obstruct regulation if such action would yield a profit, as it does in many cases. Indeed, regulation under these conditions produces a clear incentive to bribery and corruption of legislators and commissioners, and it is remarkable that such a small percentage of public officials succumb to the temptation to accept "gifts" of this sort. The most important result of the retention of the profit motive in a regulated system is the mass of obstructions, legal or otherwise, placed in the way of adequate regulation by persons who want their affairs to be free from control. As long as regulatory laws and court interpretation of these laws and of the Constitution are in conflict—and there

is little reason to anticipate any marked change in this situation in the near future—regulation cannot be wholly effective, for some individuals are quite sure to obtain court assistance in blocking certain aspects of the regulative policy.

Even in the absence of any objection to regulation, on the other hand, piecemeal regulation of capitalism cannot be entirely successful. Although the policy of control may be applied only to those aspects of capitalism which clearly are in need of government assistance, the regulation by its very nature interferes with the automatic adjustments of a system of free capitalism. If no interference occurs, the regulation is ineffective for it produces no results; if interference does occur, its effects spread to other spheres of the economy, which in turn require regulation. Thus regulation cannot stop part way but must control the entire economy if it is to be effective. Such complete control, however, is opposed even by the very liberals who seek to improve capitalism by partial regulation. The policy of regulation, therefore, does not appear to solve the problem of capitalism satisfactorily.

II. FASCISM

The fascist and nazi programs of Italy, Germany, and other countries are difficult to label. Although they are largely political in nature, they have developed certain economic characteristics in their attempts to improve upon free capitalism. It is thought by some that fascism is merely the final stage of capitalism; by others, that it is a type of collectivist system. The hybrid nature of fascism suggests the advisability of not identifying it too closely with either capitalistic or collectivistic systems.¹

The essence of fascism is the political creed of intense nationalism. The state is all and the individual nothing, according to this view. Capitalism is sound and is to be retained but waste and inefficiency must be eliminated. Thus the owners and managers of capital are subjected to strict government control, and it is quite possible to view fascism as the logical outcome of any thoroughgoing policy of government regulation. Business must be conducted so as to benefit the state first of all; otherwise the state may apply whatever remedial measures are considered to be necessary. Thus in Italy industry, agriculture, trade, and

¹ Cf. Chap. II.

finance are organized into corporations or syndicates, each of which is controlled by a council that represents employers, employees, consumers, and the Fascist party. The councils make regulations which are binding upon all in the effort to control production so as to make the state strong and self-sufficient. Peaceful settlement of all industrial disputes is enforced, and freedom, as democracies understand the term, is greatly restricted.

It is possible that this policy of strict control, if it will work at all, can be effective only under a dictatorship, where political freedom is abolished simultaneously with economic freedom. Thus many persons are strongly opposed to fascism on political grounds. From the economic viewpoint, fascism is subject to some of the weaknesses of socialism as well as of capitalism. The difficult problem of planning and coordinating production is not mitigated by the fact that property is privately owned and that owners still will obstruct regulation if they can do so. The industrial system, furthermore, may be subjected to strains under fascism which are even greater than those under capitalism, for dictatorships live by military exploits. Such events are costly and may be so wasteful as to overbalance any gains from the elimination of some of capitalism's wastes and inefficiencies.

III. COLLECTIVIST SYSTEMS

Types of Collectivist Economic System.—The discussion of the various types of economic system presented in Chap. II indicated that the distinguishing characteristic of collectivism is to be found in the marked limitations which are placed upon private property rights. Collectivists agree that personal gain from the ownership of capital and the use of property in production should be prohibited. The extent to which property rights should be altered, and the method of alteration to be used, however, vary widely according to the reform plans proposed. Thus *state socialists* or *state capitalists* wish the central government to own and operate the industrial equipment of the nation. This is collectivism—common ownership—through the political state. *Syndicalists* and *guild socialists*, on the other hand, desire collective ownership and operation of the various industries by the workers directly engaged therein. Thus the principle of trade unionism would be greatly extended so that the workers become the owners, not individually, but only collectively through their

union organizations. *Communists* comprise a third group which, dissatisfied with the halfway measures of the socialists, demand collective control of consumption in addition to common ownership of the means of production. The communist ideal might be phrased thus: "From each person according to his ability; to each according to his need." *Utopian* and *Christian socialists* essentially are communistic, since they believe in the common ownership of consumption goods. Utopians are idealistic social reformers who have been largely influenced by the ideas developed at the time of the French Revolution and believe in the perfectability of human nature. Christian socialists believe that the brotherhood of man can be attained only in a collectivist society; the program of this group is based chiefly upon religious conviction.

Some proponents of collectivism are *evolutionary*, and are typified by the opportunistic point of view of the *Fabian socialists* of England, while others, who feel that the necessary and fundamental changes never can be obtained satisfactorily in any other way, are *revolutionary*. The former type, represented by the leaders of the British Labour Party for example, stands for a gradual extension of the powers of the government or of trade unions until all industrial equipment in the nation is divorced from private control for personal gain. The revolutionary group, represented by extreme communist parties, feels that such a slow process is either undesirable or impossible and therefore stands for a sudden change to a new system, by force if necessary. Both groups in developing their philosophy have borrowed extensively from the teachings of Karl Marx, the "father of scientific socialism."

Marxian Socialism.—Although Karl Marx published his famous treatise "*Das Kapital*" in 1867, it still is the leading source from which the great mass of socialists draw their economic philosophy. One of the ideas most closely associated with the name of Marx is the economic interpretation of history. According to the great socialist, all social changes in history have had their ultimate causes in the modes of production and exchange of goods characteristic of the time. Thus economic factors are said to dominate practically all history and so to determine most of the social organization, classes, and class interests which we find about us. This analysis leads to the

conclusion that a proper modification of the economic factors will result in a new social structure which will be more equitable in its treatment of the mass of mankind. Hence socialistic change, even if it must be obtained by revolutionary means, is declared to be in the public interest.

Like other socialists, Karl Marx built his philosophy upon a theory of "surplus-value." He distinguished use-value from exchange-value and thought that labor produced all value, for without labor there would be no production. Capital he regarded merely as stolen labor; it was wealth used in the capitalistic system to exploit labor. The value of a commodity, he said, depends upon the "socially necessary" labor time required to produce it. The employee in return for his labor must be given at least a subsistence wage, but owing to the preferred position given by property rights and the tendency of the population to increase and so provide additional workers, more need not be paid. Marx assumed that perhaps half a day's work would suffice to produce subsistence for the workman and his family but declared the capitalist required a full day's labor in return for the right to work. Thus half the product of the work is paid as wages, but half remains in the hands of the capitalist as a surplus which Marx calls profits. Therefore the laborer has been exploited or robbed of half the product of his labor.

The conclusion of "*Das Kapital*" was that competition between capitalists would force the losers into the exploited ranks of labor and would strengthen still more the few successful employers. Eventually but two classes would remain: A very large class of workers existing at bare subsistence, and a very small class of capitalists living at ease upon the surplus-value which they wrung by exploitation from the great mass of mankind. Sooner or later the majority would rebel against this intolerable situation. A class revolution would dispossess the capitalists, and collective ownership of the means of production would be instituted so that exploitation would disappear. In time, the state itself, which Marxian theory regards as the instrument of class oppression, would wither away in a classless society.

Improved Status of Labor.—The first two of these points in Marxian theory may be attacked in terms of premises and logic, but the third is subject to some degree of statistical analysis. Let us confine our attention to this point. According to

Marxian doctrine, labor could not anticipate any real improvement in living standards or any significant share in industrial advancement so long as the capitalistic system remained in power. Gains of any sort would be retained by the capitalists while employees were held down to the level of bare subsistence. This situation has not been true in fact.¹ The national income has increased more rapidly than the total population because of increased productivity. Labor's share in this income has almost doubled in the last 80 years; the per capita income has increased over 600 percent; and real wages are about four times as large as at the beginning of this period. Thus we may conclude that one of the basic premises of Marxian revolutionary socialism is not consistent with the facts as we find them today. While this criticism may throw doubt upon the inevitability of the social revolution as Marx saw it, the vital significance of his work and the essential need for an understanding of the economics of collectivism are not lessened by these facts.

The Russian Experiment.—Russia offers the only example of a large-scale collectivist economic system. Since the Revolution of 1917, the U. S. S. R. has been operating under various modifications of socialism. The "planned" economy, which opportunistically has been changed from time to time, has borrowed from the experience and achievements of the United States. According to the general plan, Russian industrial production, starting at one-twentieth of the American level, was to increase in 15 years to four-fifths of the American output. Fixed capital was to increase by 50 billion dollars, an amount sixteen times Russia's original capital. The productivity of labor was scheduled to increase eight times and real wages four times. The standard of living of the Soviet worker was to reach the American level. All farming was to be carried on by the state farms or on collective farms so that no independent farmers would remain.

Sharp differences of opinion exist concerning the degree of success enjoyed by the Russian system. This much at least may be said: Like capitalism, it actually works. The standard of living of the typical Russian workman is probably higher than ever before, individuals apparently enjoy more economic security, and many of the cultural aspects of life have been made available

¹ Cf. Chap. XVII.

to the common people. In the mere 20 years of its life, however, Russian socialism has evidenced weaknesses and mistakes that make it impossible as yet to venture any final answer on the basis of this experiment as to whether collectivism or capitalism ultimately is to be preferred. Since some of the more serious problems involved in collectivism have been emphasized by the Russian example, they merit a more painstaking discussion.

Basic Problems of Collectivism.—Several problems require special analysis when a collectivist economic system is under consideration. Among these may be mentioned the necessity of money, the control of consumption, the place of interest and rent payments, the fulfillment of production plans, and the need for the profit motive. Each of these points will be examined in turn.

Necessity of Money.—Many advocates of collectivism assert as one of its supposed advantages the claim that money would be unnecessary so that the whole financial structure, which gives rise to so many troublesome problems in capitalism, could be dispensed with entirely. A moment's consideration will show, however, that collectivism cannot operate without *some* form of money. It is only under the simplest conditions that an economy can escape monetary calculations. Within the narrow confines of the family, it is true, a communistic system may exist without the use of money as a calculating device. The significance of changes in the processes of production in the self-sufficient household of the frontier may be determined with sufficient accuracy without the aid of money as a common denominator. The various activities of the members of the family, and the disposition to be made of the products of their toil, can be arranged by the head of the family without recourse to prices. In such a case relatively little capital is used and efforts are expended primarily for consumption goods.

In the incomparably more involved circumstances of a national economy using large amounts of capital in roundabout production, however, the human mind cannot orient itself properly among the bewildering array of intermediate products and potentialities of production unless it may utilize the common denominator of prices and costs provided by some form of money. Planning and management on a large scale clearly are impossible in any kind of an economy which lacks this essential tool.

Monetary Management.—In a collectivist economy there is danger of currency mismanagement, possibly to a greater extent than in a capitalistic system. Collectivism is subject at least to the same incentive to cover costs and, like capitalism, may attempt to do so on a national scale by inflation. Russia, France, and the United States all have tried to meet the problem in the same way. The discussion in Chap. IX indicated the serious effects that may result from a fluctuating medium of exchange. When the unit of account is of such national importance as would be true in a planned economy, monetary management must be unusually alert to preserve a stable unit of value. Since collectivism also is likely to use a completely managed currency system instead of an automatic or a semi-automatic money standard, the money system necessarily must be a planned one and so difficulties may be introduced which need not be present in capitalism.

Control of Consumption.—Collectivists sometimes declare that all consumers should be treated alike, even if ration cards are necessary, and insist that commodity prices would disappear under collectivism because each person would receive the same allotment of goods. The facts appear to be otherwise. The capitalist who has manufactured consumption goods and thus becomes their owner has the choice of consuming them himself or of having them consumed by others at a price. Where the community becomes the owner of the consumption goods because of collective production, however, this choice no longer exists. The community itself cannot consume; this act can be only a personal and individual one. The individual alone knows what are his wants; he alone is able to choose the goods which he desires from the innumerable alternatives available in the markets of today. Consumption imposed from above cannot fulfill the economic principle of equality of marginal utilities, and private exchanges of commodities would occur between persons who were not satisfied with the imposed regimen. Thus value determinations and exchange prices would exist, and consumption might be unequal in spite of all that state authority could do. It is for this reason that some economists declare communism to be economically unsound. Since the purpose of collectivist action is to improve the satisfaction of wants, imposed equality of consumption under a communist system almost certainly would fail to provide the best solution to the problem of consumption.

Interest and Rent Payments.—It sometimes is said that in collectivism interest, rent, and profits would disappear so that only the sole distributive share of wages would remain. Something of this position may be deduced from the preceding discussion of Marxian doctrine. A reason for this attitude is that collectivists largely have been engaged in preaching the doctrine and necessity of change and have neglected to analyze carefully the operation of the systems with which they propose to replace capitalism. If collectivism is to operate efficiently, it must produce the maximum of satisfactions at the minimum of cost, but cost does not involve labor alone. Capital must be accumulated and used economically in collectivism as in capitalism, and the economy of use can be determined only if the alternate costs of different uses of capital can be compared. To make this necessary comparison it is essential that interest—which measures the cost of capital—be computed for each enterprise. Although the interest charge may be paid back to the public as a whole and not to any individual, interest as a *bookkeeping entry* in the determination of costs and so of production plans is essential to the economical operation of any industrial system.

A collectivist system may be expected to expand its industrial operations when possible, in order to provide more commodities and so raise the standard of living. This expansion will require additional capital facilities. They may be obtained by taxation or by the use of an interest charge on existing capital. Since the latter method permits the computation of costs as well as the accumulation of new capital funds, it is the one which collectivism is most likely to use.

Rent calculations, although mere bookkeeping entries, also are necessary in a collectivist economy if land is to be utilized in an economical manner. Whenever a plot of land may be used in more than one way, the determination of the use to which it shall be put must rest upon the opportunity costs of the alternate uses. The use most productive of social gain is the one which yields the highest economic rent from the social viewpoint. Thus rent charges also are essential in a planned economy.

Fulfillment of Production Plans.—The experience of Russia furnishes an example of the pitfalls involved in attempts to plan production. In framing its general economic program of all-union development, the Gosplan (State Planning Commission)

drew up a comprehensive plan that charted the course to be taken by the industrial development of the Union for a 15-year period. Into this scheme, which could be little more than a general outline devised to raise Russian production to the American level, it attempted to fit more detailed plans for shorter periods. This attempt called for the drawing up of an industrial budget that estimates the needs for the various kinds of products for the ensuing year or years, as well as the capacity of the corresponding branches of industry, and that forecasts the output to be expected of each branch. Estimates also are made of the capital requirements, the number of workers to be employed, the currency situation, the movement of foreign trade, and other phases of the economic process.

The statistics included in the yearly and 5-year programs are referred to as *control figures*. This phrase is significant, for the data are a guide to the administrative authorities in shaping their economic policies. Thus the control figures of the Supreme Economic Council have the effect of a general order that the trusts and syndicates concerned with actual production are expected to carry out. Other departments of the government in charge of railways, banking, and agriculture, for example, use the control figures in a similar way.

Now suppose, as actually happened, that the control figures are accepted as minimum requirements but not as establishing maximum quotas. If the steel trust is expected to produce 10 million tons next year, the railroads will attempt to budget the necessary transportation for this volume. However, if production actually is 12 million tons, it may be impossible to move the additional 20 percent of output which exceeds the control figures because the plan did not call for this larger amount. Control figures, in other words, must establish both minimum and maximum quotas if they are to allow planned production to operate smoothly, yet this point apparently was not grasped by the Russian technicians who were responsible for the outcome of the planning program.

The Profit Motive in Collectivism.—It is unlikely that profits and losses would disappear in collectivism, for in a dynamic, expanding economic system it would be an unusual occurrence in which income exactly balanced outgo. While it would be the state and not individuals that would receive the profits and meet

the losses, these items would continue under collectivism although probably to a less extensive degree than under capitalism. Thus it is the profit *motive*, rather than profits in themselves, that is important in this connection.

Can an economic system function without the motivation of the private receipt of profits? It is clear that some other motive might be substituted for the search for profits if a sufficiently strong motive could be discovered. Such a driving force is to be found in capitalism. Many men continue their business endeavors after they have compiled a life competence, not because they need more income but because they seek the recognition of their fellow men and this recognition in our economic system is bestowed chiefly in terms of a man's ability to "make money." So long as a business does not operate "in the red," it is the recognition that is significant. If the largest income that any man could receive were \$15,000 a year, men probably would strive just as hard to obtain that coveted top salary as they do today to become millionaires. Thus a collectivist system may utilize this desire for recognition in the form of a very much modified profit motive. The real problem is to relate the top income, whatever it may be, not to money gain but to social service. Thus Russia has had considerable success in encouraging higher personal efficiency by granting special privileges of various kinds to the most deserving workers.

The profit motive after all affects only a very small percentage of the industrial population of the United States. Sometimes, on the other hand, the term's meaning is expanded so that it is applied to everyone who receives an income. Thus it is said that the laborer works hard because of the profit motive merely because his income varies to some degree with his productivity. Used in this broader sense, it seems to be quite true that men will not work hard without the profit motive. Russia found that equality of income led to slackness in production, and so introduced the most modern capitalistic piece rates and incentive wage plans. Therefore complete equality of income seems to be merely a utopian dream, but the inequalities necessary to encourage men to put forth their best efforts appear to be relatively slight, and the profit motive itself is not needed at all in order that production shall continue.

Engineering and Collectivism.—One aspect of a collectivist economic system is of special significance for engineers. Col-

lectivism, as we have just seen, presupposes industrial planning on a nation-wide scale. Production, marketing, finance, and income distribution plans must be drawn up to cover all the activities of the economy so that waste will be reduced to a minimum and productive effort will be directed so as to yield the maximum of satisfactions for the population as a whole. The preparation of the general plan for the nation, and of the detailed plans for each industry and plant, requires elaborate technical knowledge which can be furnished best by engineers, just as the execution of the plans involves engineering techniques similar to those now utilized in production planning within a given factory. If engineers could devise national plans which would be followed, it might be possible to provide every family with a decent standard of living, practically to eliminate business cycles and economic insecurity, and to enrich the lives of the great mass of people through a shorter working week and more leisure activities. In the final analysis, the "human" factor probably will decide the issue.

IV. ESSENTIAL ECONOMIC FUNCTIONS

In all the welter of discussion and controversy about the type of economic system we have or should have, and what we may expect from its operation, it is desirable to remember that *every* type of economic system must perform certain essential functions. First, it must lead to the production of goods and services, for the failure to perform this function would strike out any possible justification for the existence of an economic system. In addition, production not only must be sufficient to provide a subsistence standard for the members of the system but also it should supply some degree of comforts and luxuries in addition to a bare living. Second, an economic system must determine which person shall perform a given job. The determination may be based upon competitive ability and training, upon custom, accident, or chance, upon wealth and family influence, or upon political favoritism and party loyalty, to mention only a few possibilities, but the system must decide in some fashion which man is to do the pleasant, and which the unpleasant, work of the nation.

Third, every economic system must distribute among the factors of production, and among individuals, the national income which is produced. The division of the national income into

wages, interest, rent, and profits must be made upon some basis. When this division has been accomplished, the incomes of the individual claimants within each of these divisions must be determined. Shall the incomes be equal or unequal? The system must provide an answer. If it is the latter, the system must determine the degree of inequality. Finally, every economic system must provide some motivating force powerful enough to overcome man's love of leisure so that the nation's work actually will be accomplished, although the answer to this problem depends in part upon the method of distributing individual incomes. It is not sufficient that an economic system merely perform these functions, however, for most men feel also that it should do so with fairness and justice as well as with efficiency.

Problems

177. "The government will sell bonds and with the money thus secured will buy the voting stock of the railroads, then the coal mines, the steel mills, automobile factories, tire plants, electric utilities, and so on, until the government controls all the means of production. Wage earners will still draw wages; bondholders will continue to receive interest—in fact, everything will be the same as before except that the government, instead of financiers, will control business—but wait, what is the government? The government is the people—the people will control the means of production."

a. Is this socialism?

b. Would you favor this plan? Why, or why not?

178. Some socialists contend that by using the taxing power of the state it would be possible (and preferable) to socialize *income* instead of property. Do you agree? Why, or why not?

179. Could there be an economic depression in a socialistic or communistic country? Why or why not?

180. What specific steps would a socialist economic system take if it desired to increase its capital equipment at the expense of consumption?

181. "In any type of economic system in which production is completely in the hands of the ruling authority, there necessarily must be an arbitrary use of dictatorial power. The real difference between regulated capitalism in a democracy and planned economy in a totalitarian state is individual freedom." Do you agree? Why, or why not? Is the matter of security a factor in the issue?

References

BROWDER, EARL: "What Is Communism?" Vanguard Press, Inc., 1936.

BUKHARIN, N. I., and others: "Marxism and Modern Thought," Harcourt, Brace & Company, 1935.

CORRY, LEWIS: "The Crisis of the Middle Class," Covici Friede, Inc., 1935.

- : "The Decline of American Capitalism," Covici Friede, Inc., 1935
- DENNIS, LAURENCE: "The Coming American Fascism," Harper & Brothers, 1936.
- EINZIG, PAUL: "The Economic Foundation of Fascism," The Macmillan Company, 1934.
- FLORINSKY, MICHAEL T.: "Fascism and National Socialism," The Macmillan Company, 1936.
- HAYEK, F. A. (ed.): "Collectivist Economic Planning," George Routledge and Sons, Ltd., 1935 (2 vols.).
- HOOVER, CALVIN B.: "The Economic Life of Soviet Russia," The Macmillan Company, 1931.
- PITIGLIANI, FAUSTO: "The Italian Corporative State," P. S. King & Son, Ltd., 1933.
- WEBB, SIDNEY, and BEATRICE WEBB: "Soviet Communism," Charles Scribner's Sons, 1936 (2 vols.).
- WOOTTON, BARBARA: "Plan or No Plan," Farrar & Rinehart, Inc., 1935.

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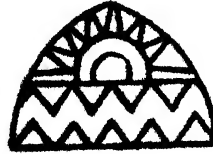
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